THE IRON TRADE REVIEW

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GREATER INTEREST

IS NOTED IN PIG IRON IN SEVERAL CENTERS

And Some Sales Have Been Made—General Suspension of Mills Until After the Holidays.

In striking contrast with the great activity of mills during last year's holiday season, there will be a general suspension of operations shortly before Christmas, and the time for resumption will depend largely upon the demand for finished products and the financial conditions prevailing after the first of the new year. Wage reductions are not nearly so numerous as in previous periods of depression, and few plants are closing on account of strikes, the one of the Pressed Steel Car Co., Allegheny, where employes are resisting a wage reduction, being an exception.

Steel Rail Specifications

The long expected announcement of new specifications on Bessemer rails agreed to by manufacturers in the United States and Canada has been made. These specifications have not been formally adopted by the American Railway Association, but are the result, to a large extent, of the work of the special committees appointed some months ago representing both the railway association and the steel makers. Clauses relating to drop tests, finishing and shrinkage were inserted in accordance with the requests of the railroads. A sliding scale of prices is based on $28 at the mill for 9 per cent discard from the ingot with 29 cents per gross ton advance for each additional 1 per cent discard. As the usual mill discard is now from 9 to 10 per cent, the price, except when additional discard is made, remains as it has been since May, 1901. General buying of steel rails has not yet started, although the Erie railroad has made a contract for between 25,000 and 35,000 tons for delivery during April, May, and June, 1908. It is expected that specifications for open-hearth rails will soon be announced. Rail mills will carry over a considerable tonnage for 1908 on account of suspensions.

Some Pig Iron Sold

A decided increase in inquiry for pig iron is reported from New York, Chicago and St. Louis and a fair tonnage has been sold, but in Pittsburg and other centers the market is still lifeless. Southern iron has been sold at somewhat lower quotations, but rumors of very low prices are apparently unfounded. Charcoal iron is lower. A number of furnaces were blown out during the past week, and there will be a further curtailment of production Jan. 1. The Steel Corporation is now operating only about 30 per cent of its capacity. The corporation will sell the foundry pig iron of the Tennessee company through its own agencies.

Inactivity of Mills

The American Sheet & Tin Plate Co. is now operating less than 40 per cent of its capacity. Half of the capacity of the Carnegie Steel Co. is idle. The National Tube Co. has only about 40 per cent of its capacity in operation. This company is building two new Bessemer converters at Lorain to replace those now in service. A moderate amount of new business in structural material is being placed, and contracts for erection work are being taken at very low figures. A large order for special steel work has been placed by the Chicago City Railway Co. with the Lorain Steel Co.

Many Coke Ovens Idle

Sixty per cent of the coke ovens in the Connellsville region are now idle. There has been a sharp decline in the price of furnace coke, is now quoted at $1.90 to $2.00.

NEW SPECIFICATIONS

FOR BESSEMER RAILS HAVE BEEN AGREED UPON.

Clauses Proposed by Railroad Interests Inserted—The Old Price for the Rail of Present Discard.

The new specifications for standard Bessemer steel rails as agreed upon by manufacturers of Bessemer steel rails in the United States and Canada, have been announced. The new specifications embodied in contracts contain several new clauses, which have been incorporated to better safeguard the purchasers. These points are such as manufacturers hertofore have not been willing to concede and include an entirely new shrinkage clause, a new clause covering the drop test, and a new clause governing finishing particularly as it regards straightening. The new contract form contains the following very important clause in regard to the percentage of crop from ingots:

> "In the manufacture of rails hereunder, there shall be cut from the end of the bloom and rails formed from the top of the ingot, a total discard equal to —— per cent of the weight of the ingot."

The basis will be $28 on Bessemer rails with a 9 per cent crop, and the contract provides for an increase of 29 cents per gross ton for each additional 1 per cent discard. This will establish standard rail prices for 1908 according to percentage of discard from the ingot and bloom as follows:

Per cent discard.	Price.
9	$28.00
10	28.29
11	28.58
12	28.87
13	29.16
14	29.45
15	29.74
16	30.03
17	30.32
18	30.61
19	30.90
20	31.19
21	31.48
22	31.77
23	32.06
24	32.35
25	32.64

The new specifications include Bessemer steel rails only, and specifications on open-hearth rails will be announced at a later date. The specifications will be found on page 989, the clauses incorporated at the behest of rail buyers being printed in italics.

THE WEEK IN IRON CENTERS

PITTSBURG.

General Inactivity During the Holidays—New Rail Specifications.

Office of THE IRON TRADE REVIEW,
521 Park Bldg., Dec. 17.

With the approach of the annual inventory period, and the time of year when it is customary for most plants to shut down during the holidays for repairs and general overhauling, there is little or no movement in any branch of the trade. The falling off of production during December will be very marked in comparison with the figures of last December when, in spite of annual shut downs and light buying because of the inventory period, there was nevertheless a heavy movement all along the line. The object now being sought by manufacturers seems to be to ascertain the minimum output limit, and still keep the wheels moving slowly. Some effort is being made in one or two directions to run a little bit heavier than conditions would otherwise warrant, in order to be prepared for a longer shut down than is now anticipated. A large portion of the steel making plants will be shut down on Saturday of this week, and remain down until after the first of the year. The Carnegie Steel Co., during the present week, is running less than 50 per cent in its finishing end, and considerably below that on its blast furnaces and mills turning out semi-finished material. The National Tube Co. is operating less than 60 per cent, Lorain and Continental being down entirely, the former largely on account of building two new Bessemer converters to replace those now in service, and the construction of new soaking pits under last year's improvement appropriation. Lorain will be down three weeks. The American Sheet & Tin Plate Co. is operating less than 40 per cent of its capacity. There have been several other shut downs aside from those mentioned from week to week during the past month, and several of the large steel foundries in the Pittsburg district are practically at the end of their order books, and contemplating a shut down before Jan. 1. The Allegheny plant of the Pressed Steel Car Co. is closed, partly because of lack of work, but primarily because of employes resisting a wage reduction. Practically 60 per cent of the ovens in the Connellsville coke region are out of blast. Aside from the purchase of between 25,000 and 35,000 tons of Bessemer rails by the Erie railroad for equal April, May and June deliveries, there has been no revival of buying in any of the finished lines, and no inquiry for either foundry or steel making irons or semi-finished material. A decided drop in the price of furnace coke is noted, together with a further decline in the price of old material. Otherwise market quotations are firm in finished lines with no activity, and purely nominal on pig iron and semi-finished material, there being no movement upon which to base the market.

Pig Iron.—There is no inquiry either for prompt shipment or for delivery through the first quarter of next year. We noted last week the sale of 500 tons of northern No. 2 foundry iron on the basis of $17 valley for delivery running into next year, but since that time there have been no sales other than in carload lots, these being on a basis of between $17.50 to $18 at the furnace. Independent furnaces are preparing to blow out, and several have refused to quote on forward deliveries. Shenango No. 1 furnace will be blown out Saturday night of this week, leaving No. 4 the only one in blast. Struthers furnace is down, two Cherry Valley furnaces are down and there is talk of blowing out Brier Hill; these in addition to two furnaces at Hubbard and the one Stewart furnace previously reported out, and two other valley furnaces that are trying to prolong operations until the first of the year. A discussion of the ore guarantee will be had some time between this and the first of the year. Under present conditions there is no hurry, as there has been no inquiry for next year ore. We quote the following nominal prices for prompt or reasonably prompt delivery in the absence of sales upon which to base a definite market:

Bessemer, Valley	$ 19.00
Bessemer, Pittsburg	19.90
No. 1 Foundry, Pittsburg	18.65 to 19.15
No. 2 Foundry, Pittsburg	17.90 to 18.40
Gray Forge, Pittsburg	17.40 to 17.90
Basic, Valley	17.50 to 18.00
Basic, Pittsburg	18.40 to 18.90

Ferro-Manganese.—Importers in several instances have, on account of the extremely light demand for alloys, withdrawn all quotations on ferro-manganese. For delivery through the first quarter of next year, we quote a nominal market of $50.50 to $51 delivered at Pittsburg, on ferro-manganese foreign 80 per cent.

Imported 50 per cent ferro-silicon is quoted $93 Pittsburg on forward deliveries; domestic 12 per cent, $34; 11 per cent, $33; 10 per cent, $32. The lower grades of imported ferro-silicon are quoted 50 cents lower. These quotations are applicable to Pittsburg territory.

Plates.—This market is very quiet as far as new business is concerned, little or none being placed with the manufacturers. There has been a decrease in the demand on specifications against old contracts although the leading consumers, aside from the shutting down of the Allegheny plant of the Pressed Steel Car Co., are running easy, this being due to the comparatively small amount of business ahead. Prices, however, are unchanged and we continue to quote as follows:

Tank plate, ¼-inch thick, 6¼ to 100 inch, 1.70c f. o. b. mill Pittsburg Extras are as follows per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than four inches in width at ends, narrowest end not being less than 30 inches, 0.10; circles, 0.20c. Plates in width over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1.00c. Gages under ¼-inch to and including 3/16-inch plate on thin edges, 0.10c; under 3/16 to and including No. 8, 0.15c; under No. 8 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—The sheet business is running light all along the line and that being received by manufacturers at this time consists for the most part of small tonnages for rush deliveries. Stocks are reported low, and are being replenished only as absolute necessity becomes imperative in order to balance up. There are a few reports of shading the official quotations on black and galvanized, but these, on account of the small volume of business offered, cannot be verified. The percentage of mills in operation by both the leading interest and independents is very small. We continue to quote:

Black steel sheets, one pass, cold rolled, Nos. 11-12, 2.20c; Nos. 13-14, 2.25c; Nos. 15-16, 2.30c; Nos. 17-21, 2.35c; Nos. 22-24, 2.40c; Nos. 25-26, 2.45c; No. 27, 2.50c; No. 28, 2.60c; No. 29, 2.75c; No. 30, 2.85c; galvanized Nos. 10-11, 2.65c; Nos. 12-14, 2.75c; Nos. 15-16, 2.85c; Nos. 17-21, 3.00c; Nos. 22-24, 3.15c; Nos. 25-26, 3.35c; No. 27, 3.55c; No. 28, 3.75c; No. 29, 4.00c; No. 30, 4.25c; blue annealed, No. 10 and heavier, 1.85c; Nos. 11-12, 1.90c; Nos. 13-14, 1.95c; Nos. 15-16, 2.05c. Corrugated roofing, $1.90 per square for No. 28 painted, 2½ inch corrugation, and galvanized, $3.25 per square for No. 28.

Tin Plate.—As a general proposition, the tin plate trade has shown a big improvement during the past few weeks, but the total tonnage on the books is far below that usually under contract at this time of the year, just prior to the first quarter. Canners and other buyers of tin plate have not placed their business as freely as is customary, partly because they are waiting as long as possible to get a better line on the financial situation and partly because they have practically been assured that there will be no change in price, and at any event they will not have to pay more by waiting. We continue to quote:

Coke tin plate, 100-pound basis, 14 x 20, $3.90 f. o. b. mill, Pittsburg district. Terms, 30 days, less 2 per cent for cash in 10 days.

Rails and Track Material.—Two items of interest have developed in the rail situation during the past week, the first and most important being the announcement of new specifications on Bessemer rails by manufacturers in the United States and Canada, carrying with it a sliding scale in prices based on $28 mill on a 9 per cent discard from the ingot, and a ratio of 29 cents per gross ton advance for each additional one per cent discard. The specifications contain new clauses on the drop test, finishing, and shrinkage. Specifications on open-hearth rails will be announced later. The second item was the placing by the Erie railroad of a contract for between 25,000 and 35,000 tons of standard Bessemer rails, for equal April, May and June, 1908, deliveries. The Edgar Thomson plant of the Carnegie Steel Co. will close down on next Saturday night and remain out until Jan. 5. On account of suspensions, this company will carry over approximately half a million tons of standard rail business into next year. On the new specification for 1908 as adopted by manufacturers of Bessemer steel rails, we quote as follows: On a basis of 9 per cent discard from bloom, with an increase of 29 cents per gross ton for each additional 1 per cent discard.

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; 8-pound, $38; 12-pound, $34 to $37; 16-pound, $32; 20-pound, $31; 25 to 45-pound, $30; angle splice bars for standard sections, $1.65; standard spikes, $1.90 Pittsburg; hand spikes, $2 to $2.05 Pittsburg.

Steel.—There is no demand for semi-finished steel and a large part of the productive capacity is shut down. Additional capacity will go down at the end of the week and will probably remain out at least until after the first of the year. Prices are nominal at $28 mill, on both Bessemer and open-hearth soft small billets. Sheet and tin bars are still nominally quoted at $31, mill. Axle billets are quoted $31 mill.

Hoops and Bands.—There has been some hesitancy on the part of buyers and an inclination to withhold placing contracts for next year's requirements because of reported contemplated change in prices. On the other hand, some new hoop and band business has been placed during the past week at the ruling quotations. Mills are showing no disposition to crowd buyers to renew expiring contracts although action on renewals will be taken after the first of the year. We continue to quote:

Hoops in carload lots, 2c; in less than carload lots, 2.10c; bands, 1.60c; base half extras as per standard steel.

Merchant Bars.—Business is exceedingly slow as far as new buying or specifying on either steel or iron bars are concerned. A little small business is sifting through every day, but the general trade is flat and lifeless with no prospects of an improvement until some little time after the first of the year. Mills have plenty of business on their books in the shape of contracts, but the order mail in shape of specifications for shipment is light, practically everything being under suspension. One bar manufacturer who was reported to be in a bad way financially has secured an extension from creditors and has tided over its difficulties. We continue to quote:

Common iron bars, 1.60c to 1.65c Pittsburg in carload lots and over, 1.65c to 1.70c in less than carloads; 1.60c base Pittsburg, plus freight to point of shipment on western deliveries; Bessemer steel bars, 1.60c net for future deliveries; 1.85c to 1.95c out of stock; plow and cultivator, 1.60c net; channels, angles, zees, tees, under three inches, 1.70c, all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30c advance. Cold rolled and ground shafting, 50 per cent off in carloads, and 45 per cent in less than carloads, delivered in base territory; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flats, 1.60c to 1.65c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.10c to 2.15. Planished and machine straightened tire steel is 1.80c base. Iron finished tire under 1¼ by 1½ inches, 1.75c; iron finished tire 1½ to ½ and over, 1.60c base. All tire subject to ½ extra on the steel card.

Structural Material.—Tenders are out on a new building for the Oliver estate, Pittsburg, amounting to about 500 tons; the Jones & Laughlin Steel Co., secured contract for the material in the new Allegheny Memorial building, 1,850 tons, and the American Bridge Co. will fabricate the material for the Manhattan bridge approaches in New York. Aside from these contracts there is very little offering and fabricating and construction companies have in many instances laid off practically their entire forces. In order to maintain organizations, some very low figures are being made on erection jobs. Mill prices are unchanged as follows:

Beams and channels, 15-inch, and under, 1.70c; over 15 inches, 1.90c; zees, 1.70c; tees, 1.75c, angles from three to six inches inclusive, 1.70c; over six inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.80c base.

Merchant Pipe.—The National Tube Co. has announced the consolidation, effective Jan. 1, of the sales forces of the Western Tube Co. and the Shelby Steel Tube Co., and hereafter all business will be done under the name of the National Tube Co. The leading interest is operating less than 60 per cent of its productive capacity. The Lorain plant is down entirely and will remain out at least three weeks, while new Bessemer converters and new soaking pits are being installed. New business is very light and scattered and consists of small lots only. Other pipe makers are also operating at greatly reduced output. Prices are unchanged and we continue to quote the following official discounts to consumers in large lots:

	—Steel—	
	Black.	Galv.
⅛ and ¼ inch	65	49
⅜ inch	67	53
½ inch	69	57
¾ to 6 inches	73	63

7 to 12 inches	70	55
EXTRA STRONG PLAIN ENDS.		
⅛ to ⅜ inch	58	46
½ to 4 inches	65	53
4½ to 8 inches	61	49
DOUBLE EXTRA STRONG PLAIN ENDS.		
¼ to 8 inches	54	43

Boiler Tubes.—The semi-annual contract period is almost at hand, but as yet very little new business for requirements covering the first half of next year has been placed, and manufacturers are not pressing the matter, as pipe contracts are of such a form as to be little more than options and a delay in placing them is not urgent under present conditions. We continue to quote the following discounts:

	Iron.	Steel.
1 to 1½ inch	42	47
1¾ to 2¼ inch	42	59
2½ inch	47	61
2¾ to 5 inch	52	65
6 to 13 inch	42	59

2¼ inches and smaller, over 18 feet, 10 per cent net extra.
2¾ inches and larger, over 22 feet, 10 per cent net extra.

Coke.—A conservative estimate of number of ovens in the Connellsville region out of b'ast is 60 per cent of the total. Production is being decreased in every direction and foreign labor is leaving the district so rapidly as to create some apprehension on the part of operators. The weekly production is below 200,000 tons per week, and by the first of the year will reach the lowest record of several years past. There is no inquiry for either foundry or furnace coke and in several instances small lots have been sold at a sacrifice in order to move them. Foundry coke is quoted $2.65 to $2.75 at the ovens and furnace coke $1.90 to $2.00 at the ovens.

Old Material.—The only transactions reported have been a little covering by dealers who sold short and are covering at the present low prices. Scrap producers are offering material a trifle more freely, but most of them have withdrawn when bids are received. A still further decline in the nominal market is noted and we quote as follows, gross tons, delivered in the Pittsburg district:

Heavy melting scrap, $13.50 to $14; re-rolling rails, $14 to $14.50; bundled sheet scrap, $10.50 to $11; iron axles, $20 to $21; old iron rails, $17 to $18; No. 1 wrought scrap, $14 to $14.50; old car wheels, $19.50 to $20; low phosphorus scrap, $17.50 to $18; machine shop turnings, $7.50 to $8; cast borings, $6 to $7; No. 1 cast scrap, $14.50 to $15.00.

Carp furnace of the Pioneer Iron Co. at Marquette, Mich., making charcoal iron, has temporarily gone out of blast.

CHICAGO.

Increased Inquiry and Some Sales of Pig Iron—Large Street Railway Order.

Office of THE IRON TRADE REVIEW,
1362 Monadnock Block, Dec. 17.

More interest was displayed in pig iron this week than for a long time past. Reports of inquiries received show an aggregate of nearly 20,000 tons upon which prices were asked. Sales for the most part in 500 to 1,000-ton lots comprised the actual tonnage changing hands, which amounted to more than 5,000 tons. Feeling about first half iron, however, is very uncertain and with iron on hand sufficient to carry them through nearly all of the first quarter, few buyers are seriously offering to take iron even at the lowest prices furnaces will quote. Southern No. 2 is undoubtedly obtainable in any quantity at $14, but prices below that are made behind closed doors. One more merchant furnace was blown out in this territory and one is to blow in.

An unusually large order for steel was placed by the Chicago City Railway Co. with the Lorain Steel Co. this week. It consisted of 30 complete layouts of special work for corner junctions and a contract for the 1908 requirements of the street railway for switches, mates and frogs. It is difficult to estimate the tonnage involved, both because of the character of the special work and the uncertainty of next year's maintenance requirements. It is estimated, however, a very large order. In other directions contracts for steel were very light. The Commonwealth Edison Co. contracted for 2,700 tons of structural material.

At the South works of the Illinois Steel Co., 10 open-hearth furnaces were shut down last week and five furnaces are idle. Both stacks at the North works are idle and it is given out that neither will be used again, having grown too old for service. All told, the Illinois Steel Co. has nine out of 21 furnaces down. A considerable portion of its mill capacity is also shut down or running on reduced schedule.

Rumors of price reductions in finished lines are not supported in fact, but a heavy pressure to sell exists in the market. Evidences of improved conditions are not lacking, but the well-informed are cautious optimists.

Pig Iron.—Inquiries for lots of iron in varying quantity and aggregating close to 20,000 tons were reported in the market during the past week. Not more than one-third of these developed into sales, which, however, is more business than has transpired for some time. Sales were distributed among Sloss-Sheffield, Pickands, Brown & Co., and the Iroquois Furnace Co., and the iron in quantities from carload lots to 2,000 tons went to jobbing foundries, machinery manufacturers and the principal agricultural implement maker.

Inquiries for large tonnages for next year's delivery have not been looked upon seriously and prices offered by buyers between $12 and $13 are not being considered by the furnaces. It is reported that $13 can be done on a practically unlimited tonnage, but no sales at that price are reported. One transaction involving 1,000 tons of Tennessee iron was reported as sold at $18.85 a week ago, delivered at Chicago. Lower prices can now be obtained, however, for prompt shipment and $14 No. 2 iron is freely offered at Birmingham.

Investigation has developed that between the iron that will be delivered in January on delayed shipments and what is already on the yards of consumers, buyers in this district are pretty generally supplied with iron for from 60 to 90 days at the present rate of operations. Unless a considerable improvement comes with the new year, inquiry will continue as it is now, simply a "feeler for the bottom prices." On the other hand, furnaces will not contract for delivery beyond the first half at present prices and all iron for future delivery is firmer than spot shipment, with a spread in the case of northern iron of from 50 cents to a dollar in quoted prices. Lake Superior charcoal iron prices are now materially lower than those quoted a week ago and $23.50 can be done. One Iroquois Furnace Co. stack was blown out during the week, but furnace "A" of the Northwestern Iron Co. is to resume shortly, accumulated orders and the expiration of extensions making this possible. We quote for prompt shipment, Chicago delivery, as follows:

Lake Superior Charcoal	$23.50 to 24.00
Northern Foundry No. 1	19.00 to 19.50
Northern Foundry No. 2	18.50 to 19.00
Northern Foundry No. 3	18.00 to 18.50
Southern Foundry No. 1	18.85 to 19.35
Southern Foundry No. 2	18.35 to 18.85
Southern Foundry No. 3	17.85 to 18.35
Southern Foundry No. 4	17.35 to 17.85
Southern No. 1 Soft	18.85 to 19.35
Southern No. 2 Soft	18.35 to 18.85
Southern Gray Forge	17.35 to 17.85
Southern Mottled	16.85 to 17.35
Southern Silveries, 4 per cent Silicon	24.35 to 24.85
Southern Silveries, 5 per cent Silicon	25.35 to 25.85
Southern Silveries, 6 per cent Silicon	26.35 to 26.85
Jackson Co. Silveries, 6 per cent	30.40
Jackson Co. Silveries, 8 per cent	32.40
Jackson Co. Silveries, 10 per cent	34.40
Malleable Bessemer	19.00 to 20.00
Standard Bessemer	19.00 to 20.00
Valley Basic	19.40 to 19.90
Alabama Basic	21.35 to 21.85

Billets and Rods.—Some small inquiries have come into the market within the past week and sales in carload lots and less have been made, but there is no animation in the present outlook. Forging billets are quoted at $33 Chicago as a minimum price. Wire rods are held firmly. We quote f. o. b. Pittsburg, rolling billets, $28; Bessemer wire rods, $37; open-hearth rods, $38 and sheet bars, $31 to $31.50.

Merchant Bars.—The mill situation as regards activity has not been improved and though some tonnage continues to be received, mills are running very light where they are operating at all. A larger volume of inquiry for steel bars was noticeable in this week's market. Store trade is more active than mill business, but buyers' demands are very light. We quote for carload lots Chicago delivery, as follows:

Bar iron, 1.75c to 1.78c; soft steel bars and bands, 1.78c, half extras; soft steel angles, less than 3 x 3, 1.88c; hoops, 2.18c base, full extras; planished or smooth finished tire steel, 1.98c; iron finish, up to 1½ x ½ inch, 1.93c base; iron finish, 1½ to 1½ inch and larger, 1.78c base; channel for solid rubber tire, ¾ to 1 inch, 2.28c, and 1⅛ inch and larger, 2.18c; smooth finished machinery steel, 2.18c; flat sleigh shoe, 1.83c; concave and convex sleigh shoe, 1.93c; cutter shoe, 2.36⅛c; toe calk steel, 2.33c; railway spring, 1.98c; crucible tool steel, 7c to 9c, with higher prices asked on special grades. Quotations on shafting are 54 per cent off the list f. o. b. Pittsburg for carload lots, and 48 per cent off for less than carload lots. On iron and steel bars from local stocks, we quote as follows: Bar iron, 2.10c, full extras; soft steel bars, $2 per 100 pounds base, plus half extras; soft steel hoops, 2.40c, full extras.

Plates.—While the mills of the principal producer in this district are well filled up on plates, enough rolling capacity is differently situated so that very prompt delivery can be obtained. There has been a comparatively large holding up of specifications on plates and consuming interests are apparently at a standstill. Prices are well maintained from mill with some easing off in store prices. We quote:

Plates, ¼-inch and heavier, 6¼ to 100 inches wide, either universal or sheared, 1.70c Pittsburg base. For extras see Pittsburg report. Freight rate to Chicago, 18c per 100 pounds for carload lots, and 21c for less than carload lots. Jobbers' prices for shipment from local stocks are as follows: Tank steel, ¼ inch and heavier up to 72 inches wide, 2.20c; 3/16 inch up to and including 60 inches wide, 2.30c; 3/16 inch, 72 inches wide, 2.55c; No. 8 up to 60 inches wide, 2.40c. Flange steel, 25c extra; heads, 25c extra.

Sheets.—Positive evidence cannot be found to substantiate the rumors of prices cut, but at the same time it is true that even extremely small orders are sought with avidity. Trade is very light with some demand for roofing sheets. We quote:

Black sheets, Nos. 8, 9 and 10, 1.90c Pittsburg; No. 28, 2.60c Pittsburg. Galvanized sheets, No. 28, 3.75c Pittsburg. Freight to Chicago, 18c per 100 pounds for carload lots, and 21c for less than carload lots. Jobbers' prices on carload lots and less from store are as follows:

No. 10, 2.30c to 2.35c; No. 12, 2.35c to 2.40c; No. 14, 2.40c to 2.45c; No. 16, 2.50c to 2.60c; Nos. 18-20, 2.70c to 2.80c; Nos. 22-24, 2.75c to 2.85c; No. 26, 2.80c to 2.90c; No. 27, 2.85c to 2.95c; No. 28, 2.95c to 3.05c; No. 30, 3.25c to 3.35c. Galvanized sheets, Nos. 10 to 16, 3.20c to 3.30c; Nos. 18 to 20, 3.30c to 3.40c; Nos. 22 to 24, 3.45c to 3.50c; No. 26, 3.65c to 3.70c; No. 27, 3.85c to 3.90c; No. 28, 4.05c to 4.10c; No. 30, 4.70c to 4.90c.

Structural Material.—The first half of the construction work for the Commonwealth Edison Co. amounting to 2,700 tons was let to the Morava Construction Co., Chicago. It is also understood that the permit for the LaSalle hotel will be issued this year though the steel work in all probability will not be let until January. No further tonnage of any volume was contracted for during the week though estimates on some moderate requirements were furnished. We quote:

Beams and channels, 3 to 15 inches inclusive, 1.70c Pittsburg. For extras see Pittsburg report. Freight rate from Pittsburg to Chicago, 18c per 100 pounds for carload lots, and 21c per 100 pounds for less than carload lots. Quotations from store are as follows:

All angles, 3 inches and larger, including 6 inches, $2.05 per 100 pounds; angles, over 6 inches, $2.15 per 100 pounds base; beams, 3 to 15 inches inclusive, $2.05 per 100 pounds base; channels, 3 inches and larger, $2.05 per 100 pounds base. Less than carload lots are $1 a ton higher than foregoing prices.

Rails and Track Supplies.—Sales of light rails are practically nil and there is little inquiry for standard sections. Rails sold under ordinary circumstances by the railroads as relayers are being kept in service and purchases are indefinitely in the future despite the known necessity for new equipment. Moderate sales of spikes and bolts are reported. We quote:

Bessemer rails, $28 to $30; less than 500-ton lots, $32; open-hearth rails, $29; light rails, Bessemer, 25 to 45-pound sections, $32; 20-pound, $33; 16-pound, $35; 12-pound, $35; and lighter sections down to 8-pound, $42, all f. o. b. mill. Track supplies vary in price according to quantity and delivery. On orders accompanying rail contracts for future delivery, we quote, f. o. b. Joliet: Angle bars, 1.65c; spikes, 2.00c to 2.10c; bolts with square nuts, 2.50c to 2.60c; with hexagon nuts, 2.75c. For carload lots or less, for prompt shipment, the following prices are asked: Angle bars, 2.25c to 2.75c; spikes, 2.40c to 2.50c; bolts with square nuts, 2.85c; with hexagon nuts, 3c.

Cast Iron Pipe.—Orders for tonnages ranging from 100 to 200 tons for three nearby towns were filled during the week, but no inquiries for other than small lots have been received or are in prospect. About 30 towns in the middle west have recently made appropriations for such improvements as would require pipe, but requirements have all been cut to the lowest possible amount. We quote as follows: 4-inch water pipe, $34; 6 to 12-inch, $33; larger sizes, $32; gas pipe, $1 a ton higher.

Merchant Pipe and Boiler Tubes.—Western mills are still running, but there is no life in trade and the usual dullness at this season, at least, is in force.

We quote mill discounts, Chicago delivery, carload lots, as follows: On steel pipe, jobbers are allowed a concession of one point and five per cent additional from the schedule in force:

	Steel. Black.	Galv.
¼ to 6 inches, inclusive	71.2	61.2
BOILER TUBES.		
	Steel.	Iron.
2¼ to 5 inches, inclusive	62.2	49.2

Mill quotations on iron pipe are from four to five points higher than above. A concession of one point from the following quotations is allowed by Chicago jobbers on carload orders for shipment from local warehouse stocks. We quote for less than carload lots as follows:

MERCHANT PIPE.	Black.	Galv.
⅛ to ¼ inch	61	45
⅜ inch	63	49
½ inch	65	53
¾ to 6 inches	69	59
7 to 12 inches	65	50

Minimum prices for wrought iron pipe, carload lots or greater, from Chicago stocks, are as follows: ⅛-inch to ¼-inch, 55; ⅜-inch, 57; ½-inch, 59; ¾-inch to 6 inches, 64; 7 inches to 12 inches, 59. Boiler tubes from store are unchanged at 60 off for steel, 47½ for iron, and 47½ for seamless, base sizes, 2⅛ inches to 5 inches.

Wire Products.—Frequent rumors of shading of prices by independent manufacturers of woven fence wire and barb wire are reported, but there seems to be obtainable no information concerning actual sales at the reduced figures. The principal producer maintains the present basis with firmness and it is understood is firmly entrenched with orders against which stocks are comparatively low. Specifications, however, are not in large enough volume to employ the full capacity of mills and reduced operations will not be unlikely. The customary idleness at the holiday season, when repairs are made, may prove sufficient. We quote to jobbers, Chicago delivery:

Wire nails, $2.23; painted barb wire, $2.38; galvanized barb wire, $2.68; smooth annealed wire, $2.08; smooth galvanized wire, $2.38; polished staples, $2.23; galvanized staples, $2.63. Carload lots to retailers, 5 cents higher; less than carload lots, 15 cents higher.

Coke.—Output of coke is at a low ebb and the demand is weak. Prices, therefore, are largely nominal and unchanged from a week ago. We quote Connellsville 72-hour foundry coke at $2.75 to $2.85 and standard Connellsville furnace coke at $2 to $2.15 at the ovens.

Old Materials.—Mills are taking scrap very slowly and extensions are being asked to a considerable extent. The wide territory over which the sale of railroad scrap is distributed to the explanation of its disposal, if it was sold. It is believed that a large quantity of railroad scrap is being withheld from the market at the present prices. There is absolutely no buying and the prices quoted are probably more than would be offered by a buyer and less than would be accepted by a seller.

Old Car Wheels	$19.50 to 20.00
Old Iron Rails	15.50 to 16.00
Re-rolling Rails (3 ft. and over)	13.00 to 13.50
Old Steel Rails (3 ft. and under)	12.00 to 12.50
Light Section Relayers, 45 lbs. and under, subject to inspection	21.00 to 23.00
Relaying Rails, subject to inspection	19.00 to 19.50
Frogs, Switches and Guards	11.75 to 12.25
Heavy Melting Steel	11.75 to 12.25

We quote net tons as follows:

No. 1 R. R. Wrought	$10.75 to 11.25
No. 2 R. R. Wrought	9.75 to 10.25
Knuckles, Couplers and Springs	9.75 to 10.25
Shafting	14.50 to 15.00
Iron Car Axles	17.00 to 17.50
Steel Car Axles	17.00 to 17.50
Dealers' Forge No. 1	9.00 to 9.50
Pipes and Flues	8.00 to 8.25
No. 1 Cast, 150 lbs. and less	13.00 to 13.50
No. 1 Mill	7.50 to 8.00
Mixed Busheling (Nos. 1 and 2)	7.50 to 8.00
Country Sheet	6.00 to 6.50
No. 1 Boiler Cut	7.50 to 8.00
Boiler Punchings	11.00 to 11.50
Cast Borings	5.50 to 6.00
Mixed Borings, etc	5.50 to 6.00
Machine Shop Turnings	7.00 to 7.50
Railroad Malleable	10.50 to 11.00
Agricultural Malleable	10.00 to 10.50
Stove Plate and Light Cast Scrap	11.75 to 12.25
Old Iron Splice Bars	13.00 to 13.50

CLEVELAND.

Market Quiet in All Lines—Furnaces Go Out.

Office of THE IRON TRADE REVIEW,
Browning Bldg., Dec. 17.

Iron Ore.—All the ore boats have been laid up for the season, except one or two stragglers which have been delayed in unloading because of the congested condition of lower lake docks. There is an immense quantity of ore on dock and every available foot of storage space has been utilized. One interest reports it has 17 per cent more ore on dock at this time than on the corresponding date a year ago. Shipping orders are few and the indications are that there will be a large amount of available ore on dock next spring.

Pig Iron.—Extreme inactivity is ruling in pig iron, and the only element of improvement to be noted is a little better inquiry for spot and first quarter shipment. Prices remain largely nominal, as sales are few, but $17.50, Cleveland, for No. 2 foundry, has been done for small lots for prompt delivery. Little expectation is held by furnace interests that quotations for the first quarter will be much different than the prevailing spot prices. Piling of iron is under way, but those furnace men who refused to accept this alternative, are blowing out their stacks. The additions to idle capacity during the past week include the furnaces of the Upson Nut Co., in this city, which has been banked; the Struthers Furnace Co., Struthers, O., and the Detroit Iron & Steel Co., Detroit. Charcoal iron smelters report but little demand at present, and orders booked will cover the output for about the next two months. Charcoal iron is quoted at about $25 Cleveland. We quote, f. o. b. Cleveland, for prompt shipment, as follows:

Bessemer	$19.90
No. 1 Foundry	18.00 to 18.50
No. 2 Foundry	17.50 to 18.00
No. 3 Foundry	17.00 to 17.50
No. 2 Southern	18.35 to 18.85
Gray Forge	17.50 to 18.00

Coke.—What little coke business is being done is largely for spot shipment, and though dull, the market inclines toward weakness. We quote furnace at from $2 to $2.50, ovens, for prompt shipment, and foundry coke at from $2.75 to $3, ovens. For future business, some producers of furnace coke are holding for the minimum of $2.50, ovens, and are unwilling to close at less than this figure.

Finished Material.—With the year-end and inventory season at hand, it is difficult to find any trace of substantial improvement in the situation and the past week has been an exceptionally quiet one in finished lines. Inquiries are few and for small tonnages although some fair sized structural contracts are being figured upon. Specifications as a rule are very light. Enough new bar iron business has appeared from day to day, lately, to keep the local mills in operation, but there is no assurance that such conditions will continue for any length of time. Bids were opened by the city of Cleveland, Tuesday, for 22 special layouts for street railway improvements, involving about $50,000 of material. Two bids were submitted and the award will be made later. Warehouse trade is light. Collections are better but there is still considerable complaint from this source.

Old Material.—There is absolutely no life in old material. Transactions are extremely light and the limited business being done is largely between dealers. The stagnant conditions are beginning to produce the effect of an accumulation of stocks in yards, which up to this time have been very moderate. One local dealer has about 2,500 tons of various grades in his yards. We quote prices, which are altogether nominal, f. o. b. Cleveland, gross tons, as follows:

Old iron rails	17.00 to 18.00
Old steel rails (re-rolling)	13.00 to 14.00
Old steel rails (under 6 feet)	13.00 to 14.00
Old car wheels	17.00 to 18.00
Old steel boiler plate	9.00 to 10.00
Steel axles	14.00 to 15.00
Malleable iron (railroad)	12.00 to 13.00
Malleable iron (agricultural)	10.00 to 11.00
Heavy steel	11.00 to 12.00
Country mixed steel	11.00 to 11.50
Low phosphorus	15.50 to 16.50

We quote net tons as follows:

No. 1 R. R. Wrought	11.50 to 12.50
No. 1 busheling	11.00 to 11.50
No. 1 machine cast	12.00 to 13.00
Iron axles	17.00 to 18.00
Axle turnings	7.00 to 8.00
Machine shop turnings	5.50 to 6.50
Grate bars	10.00 to 11.00
Pipes and flues	9.00 to 10.00
Tank iron	8.00 to 9.00
Hoop and band iron	5.00 to 6.00
Sheet iron	4.00 to 5.00
Wrought drillings	5.50 to 6.50
Stove plate	10.00 to 11.00
Cast borings	4.00 to 5.00

The No. 2 Etowah stack of the Alabama Consolidated Coal & Iron Co. was blown out indefinitely Nov. 9. The No. 2 Clifton stack is still idle on account of relining and repairs.

CINCINNATI.

Further Concessions on Pig Iron—Business Very Light.

Office of THE IRON TRADE REVIEW,
First National Bank Bldg., Dec. 17.

Pig Iron.—Business is confined to a few scattering orders for limited tonnage mainly on the basis of $13.75 and $14.00 Birmingham for either prompt delivery or first quarter of 1908. But few inquiries are pending and the general market continues quiet and easy. Northern iron is slightly easier and $17.50 at furnace can be done for No. 2 foundry. It is currently reported that an inquiry for 500 tons of malleable was disposed of by the purchaser taking on all or some part of this tonnage at $17.50 furnace in the southern Ohio district. The melt of foundry iron has continued light and even under the curtailed production, both north and south, furnaces are accumulating iron. Some firm offers at $13.50 Birmingham have been turned down, so that prices for southern iron have been fairly well maintained this week. The trade is not anticipating an improvement in demand until after the first of the year, as buyers say they will not be interested in pig iron this month. High silicon iron running 8 per cent has been sold at $26.00 furnace, but the market is regarded as easy at this price. The low grades remain dull and subject to negotiation on any prospective purchase with practically no established quotation. We quote for prompt delivery and first quarter of next year, delivered Cincinnati, as follows:

Southern Foundry No. 1	$17.50 to 17.75
Southern Foundry No. 2	17.00 to 17.25
Southern Foundry No. 3	16.50 to 16.75
Southern Foundry No. 4	15.75 to 16.25
Southern No. 1 Soft	17.50 to 17.75
Southern No. 2 Soft	17.00 to 17.25
Southern Gray Forge	15.25 to 15.75
Northern No. 1 Foundry	19.20 to 19.70
Northern No. 2 Foundry	18.70 to 19.20
Northern No. 3 Foundry	18.20 to 18.70

Finished Material.—The market is quiet with most of the business consisting of retail orders from stock. Mill orders are exceedingly light and specifications on contracts are unsatisfactory. Small orders are filled here at the following quotations:

Angles, 3 x 3 and over, 2.15c to 2.25c; beams and channels, 15 inches and under, 2.15c; small angles and architectural channels, 2.10c base; plates ¼ inch and heavier, 2.10c; 3/16 inch, 2.20c; No. 8, 2.20c; sheets (blue annealed) No. 10, 2.30c; No. 12, 2.35c; No. 14, 2.40c; No. 16, 2.50c; box annealed sheets, Nos. 18 and 20, 2.65c; Nos. 22 and 24, 2.75c; Nos. 25 and 26, 2.80c; No. 27, 2.85c; and No. 28, 2.95c. Iron and steel bars, $2 base; boiler tubes, 62 per cent off base; turnbuckles, 45 per cent off; rivets, 3.15c base; cold-rolled shafting, 45 per cent off list; steel tire, 2.10c base.

Coke.—The market continues dull and easy with but little call for either prompt shipment or contract. Inquiries for next year's supply of either foundry or furnace coke are light, as the outlook for pig iron and foundry products is so uncertain that these interests do not feel justified in committing themselves at present for either quantity or price. Current quotations in the leading coke producing districts are as follows:

	PER TON
Wise County Furnace Coke	$2.30 to 2.50
Wise County Foundry Coke	2.85 to 3.00
Pocahontas Furnace Coke, prompt shipment	2.25 to 2.35
Pocahontas Foundry Coke	2.75 to 3.00
Connellsville Furnace Coke, prompt shipment	2.30 to 2.50
Connellsville Foundry Coke	2.90 to 3.25
New River Foundry Coke, prompt shipment	3.00 to 3.10
New River Furnace Coke, contract	2.75 to 2.90

Old Material.—The market continues weak and quotations are further reduced. The following quotations represent dealers' prices:

Old No. 1 R. R. wrought, net tons	$12.00 to 12.50
Cast machine and fdy., net tons	12.50 to 13.50
Old iron rails, gross tons	17.50 to 18.50
Old steel rails (re-rolling) gross tons	13.50 to 14.50
Old short lengths, gross tons	13.50 to 14.50
Old iron axles, net tons	17.50 to 18.50
Heavy melting scrap, gross tons	13.50 to 14.00
Stove plate, net tons	10.50 to 11.50
Wrought turnings	6.00 to 7.00
Cast borings, net tons	4.50 to 5.50
Car wheels, gross tons	17.50 to 18.50

PHILADELPHIA.

Increase of Inquiries for Pig Iron Causes Better Feeling.

Dec. 16.

Pig Iron.—An increased number of inquiries reflects a somewhat better feeling in the market, but so far as new business is concerned there is practically no change from last week. There are several buyers who have put out inquiries for lots ranging from 500 to 2,000 tons, and as soon as the financial horizon clears there is no doubt that a large number will be in the field as purchasers. Salesmen's reports show that many establishments have only enough on hand to carry them about up to January, but they hesitate to buy until they see some new business coming in. In the meantime, stocks are slowly accumulating at some furnaces, and the wisdom of the sharp curtailment brought about in production daily becomes more manifest. Prices show practically no change, as they are now down to cost figures and, rather than reduce them further, producers will close their furnaces. Some changes will be made in the next two or three weeks, where furnaces will be blown out, to be replaced by others that have been relined, but the productive capacity is otherwise unaltered. Prices may be quoted as follows:

No. 1X Foundry	$19.00 to 19.50
No. 2X Foundry	18.25 to 18.75
No. 2 Plain	18.00 to 18.50
Standard Gray Forge	16.50 to 17.00
Basic	17.50 to 18.00
Low Phosphorus	25.00 to 26.00

Finished Material.—Some improvement is noticeable also in the demand for finished material, especially in plates and structural material. Taking Philadelphia alone as an example, there is a large amount of work to be done next year involving structural shapes, such as the construction of elevated railroad tracks, the erection of large buildings, and the building of new bridges, and when the railroads add their orders, it will be found that the aggregate is large, even though it does not equal this year's. In the meantime, there is the quiet natural to the Christmas season. Prices show no change, as follows: Beams, channels and angles, according to specifications, 1.85c to 1.90c; refined iron bars, 1.75c to 1.80c; steel bars, 1.75c to 1.85c; plate, 1.85c to 1.90c.

Old Material.—There is so little doing that there are practically no price changes. The mills refrain from buying, and dealers refrain from pressing scrap at further sacrifices. Prices follow:

Old steel rails	$14.00 to 15.00
No. 1 steel scrap	12.00 to 12.50
Old steel axles	19.50 to 20.00
Old iron axles	22.00 to 23.00
Old iron rails	17.50 to 18.00
Old car wheels	18.50 to 19.00
Choice scrap R. R. No. 1 wrought	14.50 to 15.00
No. 1 yard scrap	13.50 to 14.00
Machinery scrap	16.00 to 16.50
Low phosphorus scrap	16.50 to 17.00
Wrought iron pipe	11.50 to 12.00
No. 1 forge fire scrap	11.50 to 12.00
No. 2 forge fire scrap, ordinary	9.00 to 9.50
Wrought turnings	10.00 to 10.50
Axle turnings, heavy	11.00 to 11.50
Cast borings	7.25 to 7.75
Stove plates	12.00 to 12.50

NEW YORK.

Increase in Pig Iron Inquiries—Light Structural Material Sales.

Office of THE IRON TRADE REVIEW,
Room 1005, No. 90 West St., Dec. 17.

Pig Iron.—A pronounced increase in the number of inquiries is generally reported. Many of these are for small lots to piece out requirements for the year, but quite a number call for delivery through the first quarter. A few concerns, in fact, are seeking tenders on their needs for the first half and two instances are known where inquiries from small concerns cover iron for delivery throughout the year. In point of size, one inquiry for 2,000 tons for New England delivery, is current and a New Jersey consumer is asking prices on 1,200 tons. Several are negotiating for 500 tons or more. There has been some selling during the past week on the basis of $17.50, furnace, for No. 2X,

and one producer catering to the New York market is asking $18 for next year's delivery. A moderate sale of basic is reported at a price equivalent to $16.50, furnace. So far as can be learned, southern furnaces have not yet made quotations which will allow their irons to compete with northern irons in this market. One important southern interest, however, is offering its 1908 output at $14, Birmingham, and there is a feeling that this price, or perhaps one slightly lower, will be generally established within a short time and that Alabama stacks will then go after northern business actively. A meeting of southern producers is reported to be in prospect.

Further curtailment of pig iron production is evidenced by the statement that only about 30 per cent of the Corporation's capacity is operating. Sixty-seven of its stacks are idle, in addition to eight or nine of the Tennessee company, and among both independent and Corporation interests the policy of banking over the holidays will be quite general. Current quotations, revised to correct some confusion arising from last week's figures, are as follows, for tidewater:

Northern Foundry No. 1	$18.50 to 19.00
No. 2X Foundry	18.00 to 18.50
No. 2 Plain	17.50 to 18.00
Malleable	19.00 to 20.00
No. 2 Southern Foundry	18.00 to 18.50
Basic	17.00 to 17.50

Ferro-Manganese.—The trend of prices is downward, with considerable pressure to sell. One lot of about 100 tons is reported sold at close to $48, seaboard.

Finished Materials.—Structural lettings of the week have been extremely light. Milliken Bros. have taken an 800-ton job at Coney Island and the Nevada Construction Co. will go ahead with some long contemplated work for the Commonwealth Edison Co., Chicago, this involving 2,200 tons, about half of what was originally planned. The American Bridge Co. has taken the government highway bridge at Fort Snelling, 1,500 tons and a small lot of bridge materials for the Erie. The Eno hotel proposition in this city may become involved in complications arising from a lease. Steel mill capacity shows little further curtailment, but there will be general shutting down throughout the holidays and invoice time. Rolling mills in the east are already closed for the remainder of the year. The Bar Iron Association will doubtless reaffirm prices at its meeting Thursday.

The rail situation, so far as actual business placed, continues in a dormant state, but there are indications that soon after the opening of the new year considerable new business will materialize. It is also probable that by that time improvement in the financial situation will have progressed sufficiently far to make possible the filling of a large aggregate of unfilled orders carried over from the current year. Inquiry for tie plates and spikes is noticeably improved.

We quote finished materials, New York delivery, as follows. Angles, 3 to 6 inches x ¼-inch and heavier, 1.86c; beams, 3 to 15 inches, 1.86c; tees, 3 x ¼-inch and heavier, 1.91c; plates, carloads, tank, 1.86c; marine boiler, 2.26c; bar iron, 1.76c; soft steel bars, 1.76c; sheet, No. 28, black, 2.60c.

Old Materials.—Railway lists issued the first of the month were generally disposed of at approximately the levels quoted below. Current transactions are such, however, that each sale practically creates a market of its own. The following quotations, accordingly, are largely nominal. These are for gross tons, New York delivery:

Old iron rails	$20.00 to 20.50
Old steel rails, re-rolling	15.50 to 16.00
Relaying rails	23.00 to 23.50
Old car wheels	18.00 to 18.50
Old iron car axles	17.00 to 17.50
Old steel car axles	15.50 to 16.00
Heavy melting steel	10.50 to 11.00
No. 1 railroad wrought	13.50 to 14.00
Iron track scrap	12.50 to 13.00
Wrought pipe	10.00 to 10.50
Cast borings	5.50 to 6.00
Wrought turnings	7.50 to 8.00
Heavy cast scrap	15.00 to 15.50
Railroad malleable	14.50 to 15.00
Agricultural malleable	15.00 to 15.50
Stove plate	11.50 to 12.00
Grate bars	11.50 to 12.00

ST. LOUIS.

Much More Interest Shown in the Pig Iron Market.

Pig Iron.—Inquiries during the last few days have been much more numerous than they were at any time during the previous 30 days. This is very encouraging to local dealers, and is taken to indicate that foundrymen are seriously considering the necessity of contracting for the first quarter of next year. Most of the inquiries are for delivery over the first quarter of 1908, but some of them cover the first half and a few of them for all of next year.

Sales are being made for prompt shipment at $14, f. o. b. Birmingham for No. 2. The market seems firm at this price for shipments for the first three months. For the second quarter, one of the large furnace interests refuses to quote anything.

Shipments are moving along in a satisfactory manner, and there seems to be plenty of equipment and no difficulty in getting iron forwarded on contract. Our quotations, f. o. b. Birmingham, to which freight of $2.80 to East St. Louis and $2.90 to St. Louis is to be added, follow:

No. 1	Southern	$14.50 to 15.00
No. 2	Southern	14.00 to 14.50
No. 3	Southern	13.50 to 14.00
No. 4	Southern	12.50 to 13.00

Coke.—The demand for strictly first-class Connellsville foundry coke is about the same as has prevailed for the last two or three weeks. There are no new developments of any consequence, and in all probability not much new business will result until after the first of next year. Shipments are being forwarded strictly in accordance with contract specifications, and there is plenty of coke to be had. Prices are as follows:

Connellsville select, 72-hour foundry coke, $3 to $3.25 for future delivery. For spot shipment some brands are offered as low as $2.75, while better grades are sold as high as $3.25. There is no demand for furnace coke, and prices for that grade range from $2 to $2.25. Smelter coke is held at $1.60 to $2 f. o. b. ovens. The rate to East St. Louis is $2.80 and to St. Louis, $2.90. Virginia coke, 72-hour, is offered at $3 f. o. b. ovens, on which the rate is $2.80 to East St. Louis, $2.90 to St. Louis and $2.40 when destined beyond.

Finished Material.—No plans for new building have taken definite shape, and none is looked for to materialize until the financial flurry has entirely disappeared. Work on the new $3,000,000 bridge that the McKinley electric railway system is building over the Mississippi river, between St. Louis and East St. Louis, is giving employment to about 200 men; some new electric tracks are being constructed in East St. Louis, and business gives evidence of assuming a normal tone. Banks are paying out currency with more freedom than for the last 30 days.

Old Material.—The market does not show any more healthy tone than it has for some time, and dealers are not expecting any improvement until more mills start up and money becomes easier.

BUFFALO.

Lackawanna Structural Mill Resumes —Other Mills May Follow.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, Dec. 16.

Pig Iron.—The one noticeable improvement in market conditions here is that collections are much better, indicat-

ing a growing easiness in money circles. There is some selling in carload lots and inquiries are more numerous than they have been for some time past, but there still seems to be that same disposition on the part of foundrymen to wait till the first of the year for a change. The furnace men are of the opinion that buying will soon have to be resumed and they maintain that there can be no further reductions in prices from those quoted last week, without going below the cost of production.

Following on the heels of the resumption, Monday, of the structural mill of the Lackawanna Steel Co., as predicted in these columns last week, it is reported today that the light rail mill and the plate mill of the same concern will probably resume the week of Dec. 30. When in full operation this company employs about 7,000 men.

The following prices, which in some instances might possibly be shaded a trifle, are quoted as representing the market:

No. 1X Foundry	$19.00 to 19.50
No. 2X Foundry	18.50 to 19.00
No. 2 Plain	18.00 to 18.50
No. 3 Foundry	17.75 to 18.25
Malleable Bessemer	18.50 to 19.00
Gray Forge	17.50 to 18.00
Charcoal	25.00 to 26.00

BIRMINGHAM, ALA.

Southern Pig Iron Market Dull, but Prospects Improve.

Dec. 16.

The southern pig iron market continues dull, but there are many evidences that the prospects are growing brighter almost daily. The production remains at the low water mark while but little business is being handled by the furnace companies. The local consumption has been off some recently, an accident at one of the larger cast iron pipe shops and a temporary shut down at one of the larger foundries having some effect on the melt at home. Both of these concerns are to resume operation again in the next few days. It is not believed that there will be much further curtailing of production at furnaces in this district and with but one or two exceptions all furnaces now in blast will continue in full operation through the holiday season.

Very little iron is accumulating in this district and there is no inclination to lay by any of the product.

The steel rail mill of the Tennesee Coal, Iron & Railroad Co. is making a record. During the past week 1,130 tons of rails were produced in 24 hours. Supt. Sounderland of the rail department has been congratulated on the results.

The Pittsburg Construction Co. will begin on the first of the coming year to build new ore bins at the steel and furnace plant of the Tennessee company at Ensley.

The statement of conditions of the Southern Steel Co. by the receivers to the creditors during the past week, did not show up the affairs of that company in the best of shape. It is figured that creditors will get about 50 cents on the dollar. Steps are being taken looking to a reorganization of the company.

BRITISH IRON MARKET.

Pig Iron Stocks Reduced—Blast Furnaces Being Blown Out.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation Street,
Birmingham, Eng., Dec. 7.

The pig iron business has remained fairly steady this week, today's quotation being 49s 7d ($12.14) for Middlesbrough warrants, which varies only a few pence from the figure a week ago. There has been a further reduction in stocks bringing the present total down to 90,996 tons. A strange coincidence with this reduction is the stoppage of seven furnaces in Middlesbrough, representing a reduction of output of about 10,000 tons a week. There are great complaints by makers, that even with the fall in the prices of coke and ore, pig iron smelting is unremunerative. All the furnaces stopped are badly in need of repairing and relining. Several furnaces needing repairs, in Northamptonshire, Derbyshire, and Staffordshire will be blown out shortly. There are no stocks apart from Connal's, and the shipments for November, 146,972 tons, were the largest ever recorded for that month. The stock of warrants declined 22,577 tons during the month. Buying of pig iron is entirely from hand to mouth, but smelters find the greatest difficulty in discharging their obligations in regard to delivery. South Staffordshire market is the strongest of the Midland group with forge iron at 54s ($13.22) and foundry 57s 6d ($14.80). The hematite market is quite demoralized, the news of further importations of steel having increased the depression. A large number of furnaces have been blown out. Hematite prices are slightly lower on the week, makers finding it difficult to obtain 68s ($16.64) per ton for mixed numbers.

The nut and bolt manufacturers met at Pittsburg Wednesday and reaffirmed prices.

METAL MARKET

NEW YORK.

Dec. 17.

Copper.—There is but little demand for exportation and domestic consumers are buying very moderately, the result being that the market continues its inactive state. Prices are on the following level: Lake, 13c to 13¼c; electrolytic, 12¾c to 13¼c; casting, 12½c to 13c.

Pig Tin.—Weakness in the London market has been reflected by a less active market in this country, with transactions extremely limited. The price level is about 28c, with spot metal still bringing a slight premium.

Pig Lead.—Stocks continue to accumulate and as demand is in no wise improved there is increased pressure to sell. The New York range is from 3.80c to 3.90c.

Spelter.—Prices are sagging because of light demand and stock accumulation. We quote: 4.25c to 4.35c, New York; 4.15c to 4.25c, St. Louis.

Antimony.—There is little activity in the market. Prices are lower than a week ago and the tendency is still downward. We quote: Cookson's, 9¾c to 10c; Hallett's, 9c to 9½c; ordinary brands, 8c to 8¼c.

CHICAGO.

Dec. 17.

Trading in metals is very desultory. Copper remains in price as it was a week ago. Tin and lead have experienced a pronounced weakness and prices are off correspondingly. We quote:

Lake copper, 15c to 15½c; casting, 14½c; pig tin, 30c; spelter, 4.65c to 4.75c; pig lead, desilverized, 4.00c in 50-ton lots; corroding, 4.50c to 4.65c in 50-ton lots; car lots 2¼c per 100 pounds higher; sheet zinc, 7c list, f. o. b. La Salle, in car lots of 600-pound casks; Cookson's antimony, 12½c to 13c; other grades, 12c to 12½c.

There is nothing of significance in the scrap metal market and the condition of sagging prices characterizes its weakness. We quote prices to dealers as follows:

Copper wire, 11c; heavy copper, 11c; light copper, 10c; heavy red brass, 10c; heavy yellow brass, 8c; light brass, 5½c; No. 1 red brass borings, 8¾c; No. 1 yellow brass borings, 6½c; brass clippings, 8c; tea lead, 2⅝c; lead scrap, 2⅞c; zinc 17c; tin pipe, 21c; pewter, 14c; electrotype plates, free from wood, 3½c; electrotype dross, 2¼c; stereotype plate, 4c; stereotype dross, 2½c; prime slab zinc dross, $55 per ton.

ST. LOUIS.

Dec. 16.

Lead and Zinc.—The highest price paid for zinc ore in the Joplin district last week was $36, on an assay base price of 60 per cent ore, from $28 to $33. The highest price paid for lead ore during the corresponding **time was $36, ranging down to $33 a ton.**

The demand was somewhat stronger than during the previous week, but it was not sufficient to cause a reaction in prices. The production was decreased about 500 tons during the week by the shutting down of plants. At no time during this year has the output been so greatly curtailed, and it is believed that this will bring an upward tendency in ore prices within the near future.

CHANGE IN NATIONAL TUBE CO. SALES ORGANIZATION.

Beginning Jan. 1, 1908, the sales departments of the Western Tube Co. of Illinois, and the Shelby Steel Tube Co. of New Jersey will be consolidated with the sales department of the National Tube Co., and thereafter all business will be done under the name of the National Tube Co. While it has been well known to the trade that the Western and Shelby companies were constituents of the National Tube Co., these concerns have hitherto maintained separate sales departments.

The personnel of the new sales organization of the National Tube Co. will be as follows. Edward Worcester, first vice president and general manager of sales; James W. Downer, assistant general manager of sales; John Duncan, assistant general manager of sales; H. S. White, assistant general manager of sales. All these officers will be stationed at the general office of the company, Frick building, Pittsburg.

For the greater convenience of the trade, nine local sales offices will be maintained instead of five, and will be located as follows and be in charge of the following managers:

New York, Battery Park building, Clifton Wharton Jr., manager of sales; sub-office, Pennsylvania building, Philadelphia.

Pittsburg, sixteenth floor Frick building, A. M. Lally, manager of sales.

Chicago, Commercial Bank building, H. S. Raymond, manager of sales.

St. Louis, Chemical building, E. A. Downey, manager of sales.

San Francisco, Crocker building, George S. Garritt, manager of sales; Thos. W. Brooks, assistant manager of sales.

Portland, Ore., R. R. Hoge, manager of sales; sub-office, Seattle, Wash.

Denver, Majestic building, Edwin H. Fowle, manager of sales.

New Orleans, Hugo Weidmann, manager of sales.

Atlanta, Ga., Candler building, Edward Worcester Jr., manager of sales.

RECEIVER APPOINTED

For the Sheffield Iron & Coal Co.—Friendly Foreclosure.

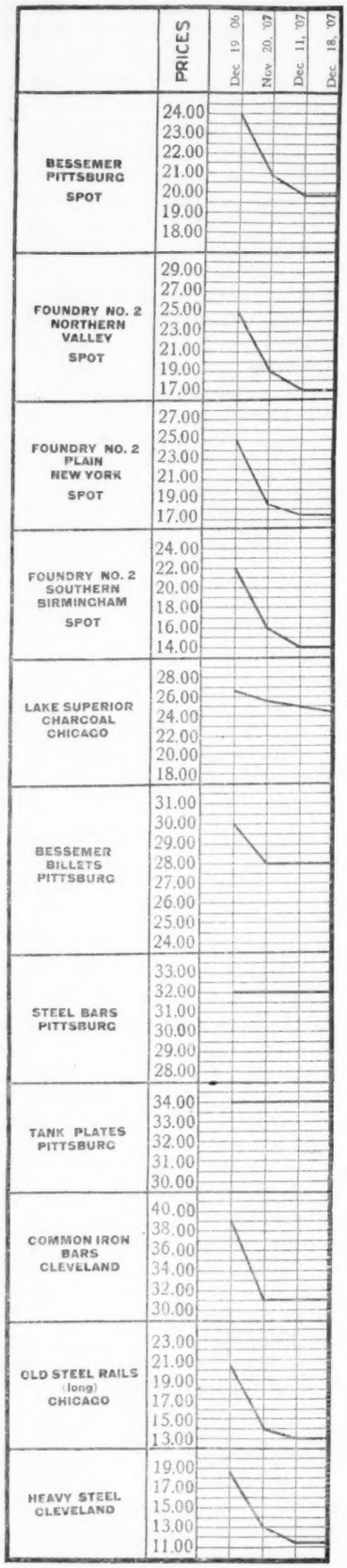
(Special Correspondence.)

Birmingham, Ala., Dec. 16.—The furnace of the Sheffield Coal & Iron Co., of Sheffield, Ala., closed down the last of the past week and the company has gone into the hands of a receiver, Benjamin Strong Jr., of New York. The proceedings were instituted in the United States circuit court by the Bankers' Trust Co. of New York, of which Mr. Strong is an officer and which company is trustee for the bondholders. The trust company holds two mortgages on the property of the Sheffield Coal & Iron Co. It is stated that the appointment of a receiver is in the nature of a friendly foreclosure proceeding, and a necessary step to raise more working capital. Plans to that end are under way in New York. W. M. Jones, at present secretary and treasurer, will have immediate supervision of the property in Sheffield as the trust company's local representative. It is stated that the shut down will be for a short period.

The Sloss-Sheffield Steel & Iron Co. will, during this week, close down some of its coal mines, the stock on hand at furnaces in blast being sufficient to meet all needs until the production of iron picks up. This company is in no way connected with the Sheffield Coal & Iron Co.

Pushing Trade Schools.—The Cleveland branch of the National Metal Trades Association is offering to cooperate with the board of education in the city of Cleveland in the establishment of trade schools. The association has asked the school officials to provide for the appointment of a committee representing the Builders' Exchange, the Chamber of Commerce, the United Trades and Labor Council, the Metal Trades Association, the Y. M. C. A., the Case School of Applied Science, and other institutions, with a view of discussing the adoption of the best curriculum for the new Cleveland technical high school. The association states that there is a constantly growing scarcity of skilled labor in the various trades owing to the lack of education.

PRICE CHART.



SPECIFICATIONS FOR BESSEMER RAILS.

(1) CHEMICAL COMPOSITION

	50 Lbs. up to 60 Lbs.	61 Lbs. up to 70 Lbs.	71 Lbs. up to 80 Lbs.	81 Lbs. up to 90 Lbs.	91 Lbs. up t 100 Lbs.
Carbon	0.35 to 0.45	0.35 to 0.45	0.40 to 0.50	0.43 to 0.53	0.45 to 0.55
Phosphorus	not over 0.10	not over 0.10	not over 0.10	not over 0.10	not over 0.10
Silicon	not over 0.20	not over 0.20	not over 0.20	not over 0.20	not over 0.20
Manganese	0.70 to 1.00	0.70 to 1.00	0.75 to 1.05	0.80 to 1.10	0.84 to 1.14

(2) *SHRINKAGE*

The number of passes and speed of train shall be so regulated that on leaving the rolls at the final pass, the temperature of rails of sections 75 pounds per yard and heavier will not exceed that which requires a shrinkage allowance at the hot saws of 6 7/16 inches for a 33-foot 75-pound rail, with an increase of 1/16 inch for each increase of 5 pounds in the weight of the section.

No artificial means of cooling the steel shall be used after the rails leave the rolls, nor shall they be held before sawing for the purpose of reducing their temperature.

(3) *DROP TEST*

One drop test may be made on a piece of rail not less than 4 feet and not more than 6 feet long, selected from each blow of steel.

The rails shall be placed head upward on the supports and the various sections shall be subjected to the following impact tests under a free falling weight:

Weight of Rail per Yard	*Height of Drop in Feet*
75 to 79 pounds	*17*
80 to 89 pounds	*18*
90 to 100 pounds	*19*

If any rail breaks when subjected to the drop test, two additional tests will be made of other rails from the same blow of steel, and if either of these latter tests fail, all the rails of the blow which they represent will be rejected; but if both of these additional test pieces meet the requirements, all the rails of the blow which they represent will be accepted.

The drop-testing machine shall have a tup of 2,000 pounds weight, the striking face of which shall have a radius of not more than 5 inches, and the test rail shall be placed head upward on solid supports 3 feet apart. The anvil block shall weigh at least 20,000 pounds, and the supports shall be part of, or firmly secured to, the anvil. The report of drop test shall state the atmospheric temperature at the time the test was made. The testing shall proceed concurrently with the operation of the mill.

(4) SECTION

Unless otherwise specified, the section of rail shall be that recommended by the American Society of Civil Engineers, and shall conform, as accurately as possible, to the templet furnished by the railroad company consistent with clause No. 5, relative to specified weight. An allowance in height of 1/64 of an inch under, and 1/32 of an inch over and in width of 1/16 inch will be permitted. A perfect fit of the splice bars shall be maintained.

(5) WEIGHT

The weight of the rails shall be maintained as nearly as possible, after complying with clause No. 4, to that specified in contract. A variation of ½ of 1 per cent for an entire order will be allowed. Rails shall be accepted and paid for according to actual weights.

(6) LENGTH

The standard length of rails shall be 30 or 33 feet. Ten per cent of the entire order will be accepted in shorter lengths, varying by even feet down to 24 feet. A variation of ¼ of an inch in length from that specified will be allowed.

(7) BRANDING

The name of the maker, the weight of the rail and the month and year of manufacture shall be rolled in raised letters on the side of the web, and the number of the heat shall be so stamped on each rail as not to be covered by the splice bars.

(8) DRILLING

Circular holes for splice bars shall be drilled in accordance with specifications of purchaser. They shall in every respect accurately conform to drawing and dimensions furnished and shall be free from burrs.

(9) *FINISHING*

Rails shall be carefully hot straightened so as not to vary, throughout their entire length, more than 5 inches from a straight line in any direction when delivered to the cold straightening presses. Those which vary beyond that amount or have short kinks shall be classed as No. 2 rails and shall be so stamped. The distance between supports of rails in the gagging press shall not be less than 42 inches. Rails shall be straight in line and surface when finished—the final straightening being done while cold—smooth on head, sawed square at ends—variations therefrom to be not more than 1/32 inch—and prior to shipment, shall have the burr caused by the saw cutting removed and the ends made clean. No. 1 rails shall be free from injurious defects and flaws of all kinds.

(10) INSPECTION

The inspector representing the purchaser shall have free entry to the works of the manufacturer at all times while his contract is being executed, and shall have all reasonable facilities afforded him by the manufacturer to satisfy him that the rails are being made in accordance with the terms of the contract. All tests and inspection shall be made at the place of manufacture prior to shipment, and shall be so conducted as not to unnecessarily interfere with the operation of the mill. The manufacturer shall furnish the inspector, daily, with carbon determinations of each heat, and a complete chemical analysis every 24 hours, representing the average of the other elements contained in the steel for each day and night turn. Analyses shall be made on drillings taken from small test ingots, the drillings being taken at a distance of not less than ¼ inch beneath the surface of said test ingots. On request of the inspector, the manufacturer shall furnish drillings for check analysis.

(11) NO. 2 RAILS

Rails which by reason of surface imperfections are not classed as No. 1 rails, shall be considered No. 2 rails; but No. 2 rails shall not be accepted for shipment which have flaws in the head of more than ¼ inch; or in the flange of more than ½ inch in depth; and these shall not, in the judgment of the inspector, be, in any individual rail, so numerous or of such a character as to render it unfit for recognized No. 2 rail uses.

(12) DESIGNATION OF NO. 2 RAILS AND SHORT LENGTHS OF NO. 1 RAILS

Both ends of all No. 2 rails shall be painted white. Both ends of all short length No. 1 rails shall be painted green.

Specifications for Standard Steel Splice Bars.

(1) PHYSICAL PROPERTIES

Test pieces cut from head of splice bar must show

a. Ultimate strength, 54,000 to 64,000 pounds per square inch.
b. Elastic limit, not less than one-half the ultimate strength.
c. Elongation, not less than 25 per cent measured in 8 inches.
d. Bending test, 180 degrees flat on itself, without fracture on outside of bent portion.

(2) FINISH

All splice bars shall be smoothly rolled and true to templet. The name of maker and year of manufacture shall be rolled in raised letters on the side of the bar. The bars shall be sheared accurately to length and free from fins or cracks, and shall be perfect fit to the rails for which they are intended.

(3) WORKMANSHIP

The punching and notching of splice bars must be accurate in every respect to drawing and dimensions furnished.

(4) INSPECTION

The inspector, representing the purchaser, shall have free access to the works of the manufacturer at all times while his contract is being executed, and shall have all reasonable facilities afforded to satisfy him that splice bars are being made in accordance with contract.

IMPROVED CONDITIONS

Are Apparent in the St. Louis District—Money Situation Better.

(Special Correspondence.)

St. Louis, Dec. 17.—The opening of the big Republic iron and steel plant in East St. Louis last week with a force of 300 men and the promise that 200 more would be added today, is believed to mark the passing of the financial flurry in that city. The plant usually employs 800 men, and the statement that men will be added until the full force is at work is confirmed by Foreman John Henson.

At the American Steel plant, Twenty-second street and Broadway, East St. Louis, 50 men are at work, although no promise of continuing operations has been made by the management. When the plant closed about Dec. 1, it was announced that a scarcity of orders existed. Additional men are being put to work daily in the East St. Louis railroad yards, and an increased activity is noticeable at the stock yards and packinghouse plants.

The Obear-Nestor Glass Co., East St. Louis, announced last week that on Jan. 1, it would put on full night and day forces. At present only a day force is employed. When the new arrangement becomes effective, three shifts of eight hours each will be worked, and 800 men will be on the pay roll. The present force numbers 300.

Application for a receiver for the Beall Bros. Implement Co. at Alton, Ill., owned by Mayor Edmond Beall and his relatives, was made at Edwardsville, Ill., last week by Pearl B. Gates and his wife, Mary E. Gates. An accounting is also asked. The company owns plants at Alton and East St. Louis, and is alleged in the petition to do a business aggregating $500,000 a year.

Fewer men are out of employment in St. Louis than a week ago, and the money stringency seems to be passing. Banks are more liberal in letting out money on depositors' checks, and pay rolls are nearly all liquidated in cash.

Plants Are Merged.—The American Steel & Iron Co. has been organized to take over the plants of the Norwalk Steel & Iron Co. and the Wm. Kavanaugh Co., Norwalk, O. The officers of the two companies with other capitalists will be included in the officers and stockholders of the new company. The Wm. Kavanaugh Co. manufactures oil well machinery and tools.

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NO WAGE REDUCTIONS PROMISED IN IRON INDUSTRY.

While formal announcements have not been made by the leading steel interests there is good reason to believe that there will be no general wage reductions on Jan. 1. The prospect amounts to a practical certainty with respect to wages in the Connellsville regions, as were a reduction contemplated by the leading interest the fact would, in the ordinary course of events, have become public property before this. A few small reductions have been made by minor independents, and they seem to constitute the exception which tests the rule. At the blast furnaces, steel works and rolling mills in the central west it is pretty well established that there is no immediate intention of reducing wages.

Were the Lake Superior ore mines in operation as much could not be said for them, there being no doubt that extensive wage reductions would be in formulation for them. Winter activities are confined to a limited number of underground mines. There may be reductions when the season opens, and a general clearing up of old scores. Indeed, the present depression has one decided bright spot for the ore interests, a fact which can be appreciated by those who have but a moderate knowledge of the labor situation which the ore interests have had to face in the past few seasons. The reduced pressure promised for next season will, incidentally, give an opportunity for more extensive stripping operations, this being one way of reducing labor troubles, the underground miners being by far the least tractable. The advantage of open pit mining must be very great when they lead to the stripping of as much as 110 feet of overburden, as is being done.

The policy of the iron and steel trade of not making a general reduction in wages at this time is in keeping with the avowed intention of holding prices at practically the present level. There is a better basis for the effort to maintain prices, if wages are not reduced, than there would be if a general wage reduction were made. Then, it must be remembered, that there has been no great wage advance in the iron and steel trade proper. The wages are, in the main, on a reasonable level and if there has been any complaint it has been chiefly that wage costs based on common labor have been high, and that has been a function of low efficiency rather than high rates. The labor boss who formerly had to take every man who came along quickly got into a different position and is not slow to get very much better results per man in the present situation.

THE SEASON ORE MOVEMENT.

Despite the slowing down of iron ore operations towards the close of the navigation season, shipments of Lake Superior ores have made a new record by between 3,000,000 and 4,000,000 tons. The statistics of shipments down the lakes, presented last week, showed a total for the season, by water, of 41,288,755 tons, a gain of 3,775,160 tons over the movement in 1906. The gain in total shipments cannot be much different from this, as last year's all-rail shipments were 1,008,544 tons and the total for this year cannot show much variation, indicating a grand total for this season, by lake and all rail, of about 42¼ million tons.

Had there been no labor troubles in the summer, and had operations been continued up to the limit until the end of the season, the year's total could easily have been made 44,000,000 tons.

Next season promises to be an off one, but a great deal of stripping and other work is likely to be done and the machinery of ore mining and transportation bids fair to be put in such shape that in 1909, or whenever demand requires, it will be possible to mine and ship 50,000,000 tons of Lake Superior ore in a season, this, of course, without any great increase to dock and transportation facilities.

As the figures of 1907 ore movement stand, they represent double the tonnage which was moved in 1901, only six years ago. Indeed, the Lake Superior ore tonnage has doubled pretty regularly in six or seven years for a long while, and there seems to be no end to the movement. Doubtless one will appear, but it is not immediately in sight when it is so easy to foresee an increase to 50,000,000 tons or more as soon as the tonnage is required. Little is required but the demand for pig iron to enforce such a total, as the blast furnaces lately completed, and others which are now being built, will require an increase to about this figure. The new demand of the blast furnace industry has been almost wholly for Lake Superior ores. Of the absolutely new furnaces which have been completed since Jan. 1, 1906, or are being built at the present time, fully 95 per cent are directly tributary to the Lake Superior region. The total represents between 6,000,000 and 7,000,000 tons of annual pig iron capacity, so that the percentage is convincing of the country's dependence upon the Lake Superior region.

REAL IMPROVEMENT

Shown in Some Lines of Machinery—Providing Panama Equipment.

Office of THE IRON TRADE REVIEW, Browning Bldg., Cleveland, Dec. 17.

Some elements of genuine improvement are appearing in the machinery market in the Cleveland district, but as yet these are not general in their nature. Some machine tool sellers report that the business taken in the first week of December has more than offset the total volume of sales in the entire month of November. This movement has been gradual since its beginning, and prospective purchasers, who declared the making of contracts out of the question when the financial stringency made itself felt, are now closing for their requirements. There has been some buying of machine tools by railroads, though not in this territory, and the influence of these transactions is expected to revive several railroad projects in this district, which have been temporarily held up in view of commercial conditions.

The current sales remain comparatively small, being made up largely of single tools, but they have combined to produce a better feeling among dealers. A fair business is being done in air drills, principally for quarry work and in coal mines, where operators are using this tool more extensively in their work. In the line of steam shovels and dredges, considerable work for the Panama canal is being done in this territory, but the demand from railroads for this class of equipment has practically ceased. Some of this business, however, is expected to reappear by spring. Manufacturers anticipate that their business in the near future will be made up largely of dredges for drainage and irrigation purposes and for mining work.

Considerable stocks are being carried by some machine tool plants, and where six months were required for delivery several months ago, a tool can now be manufactured from the pig iron and placed in the buyer's hands in a month's time. Some plants report their curtailment to be about one-fourth of their normal capacity.

Financial conditions are still severe in that it is difficult to obtain capital accommodations of any magnitude, and this state of affairs is holding in suspension a number of manufacturing projects in this district which will require considerable mechanical equipment.

The Macbeth Iron Co., Cleveland, is now erecting one of its blowing engines at the plant of the St. Louis Blast Furnace Co., St. Louis. The engine is 44 and 84 x 60 inches. The steam cylinder is operated by a piston valve which is provided with an adjustable cut-off, a new departure in this line which has been very successful on engines recently erected by the company. During the present year the Macbeth Iron Co. in addition has installed three similar engines at the new furnace of the Josephine Furnace & Coke Co., Josephine, Pa., and one at the Hamilton furnace of the Hanging Rock Iron Co., Hanging Rock, O. The company has also recently erected two of its 42 and 84 x 54-inch engines at the furnace of the Roane Iron Co., Rockwood, Tenn., making five duplicate engines erected at this plant in the last few years.

Owing to the temporary reduction in the price of Buckeye electric blue printing machines, manufactured by the Buckeye Engine Co., Salem, O., active trade is reported in this specialty. Recent orders have been received from the Taplin Rice Clerkin Co., Akron, O.; the Lawrence Machine Co., Lawrence, Mass.; the Goulds Mfg. Co., Seneca Falls, N. Y.; the Decatur Bridge Co., Decatur, Ill.; the Barber, Colman Co., Rockford, Ill.; the International Harvester Co., Akron, O.; the McClave Brooks Co., Scranton, Pa., and the city of Peoria, Ill.

Trade Papers Organize.—The Trade Press Association of Cleveland has been organized by editors and representatives of the trade papers published within the district surrounding that city for the consideration of problems of mutual interest to its membership. The following officers have been elected: President, George Smart, of THE IRON TRADE REVIEW; vice president, S. D. Leslie, of *Concrete Engineering;* secretary, R. I. Clegg, of *Wood Craft;* treasurer, C. B. Fairchild, of the *Electric Traction Weekly,* These officers, with Alfred S. Porter, of *Glass and Pottery;* W. D. Browning, of the *Industrial Magazine,* and Charles T. Walker, of the *Street Railway Journal,* will constitute the executive committee.

Structural Required.—Several new construction projects at Columbus, O., and vicinity will require some structural steel, the contracts for which are yet to be placed. The business building being erected by the F. & R. Lazarus Co., Columbus, will need 460 tons of structural, while between 500 and 600 tons of steel will go into the new plant of the John Willi Evaporated Milk Purification Co., at Marysville, O.

CONSIDERABLE INQUIRY

In the Cincinnati Machinery Market—Considering a Uniform Contract.

Office of THE IRON TRADE REVIEW, First National Bank Bldg., Cincinnati, Dec. 16.

Conditions in the machinery market and among the manufacturers show no particular change as compared with a week ago. New business is not increasing in actual orders, but inquiry is continuous and of a character indicative of order placing after the close of the year. There appears to be a considerable amount of deferred buying which it is believed will develop into actual purchases after inventories have been taken and statements of the year's business for 1907 have been completed and recommendations for changes and purchases come under consideration for 1908. It is hoped that financial affairs will show improvement by that time and that orders for prompt delivery will be coming in. In the meantime manufacturers are operating on conservative lines, which is but natural under the conditions of general business affairs. Machinery dealers report a fair run of inquiry and an improvement in collections. As noted last week, the cancellations have stopped and all orders in hand are being worked through. Some of the plants have enough business booked to justify full operation on full time.

The uniform form of contract for the purchase of castings which has been under consideration by the machine tool builders and by the foundry interests is still unsettled. The matter has progressed to a point where the foundrymen have a form of contract to submit to the machine tool builders and the machine tool builders will hold a meeting this week to consider a form of contract which may be adopted as satisfactory to serve in making their purchases. It is not clear now as to whether a contract form will be evolved which will be satisfactory to both interests.

The Oesterlein Machine Co. has increased its capital from $30,000 to $100,000 for the purpose of making improvements and extensions.

Reduces Structural.—The German Steel Association, according to cable dispatches from Berlin, has voted to reduce the price of structural forms of steel and half-rolled steel $2.50 a ton, effective Jan. 1. As this is the first reduction made by the association for the home market since the recent changes in the market situation, the step is regarded as significant.

NEW ENGLAND FOUNDRYMEN

Will be Represented at Philadelphia Meeting to Consider Short Weights.

It was a large gathering of members and friends that attended the meeting of the New England Foundrymen's Association which was held Dec. 11 at the Exchange Club, Boston. The association resumed its custom of holding an afternoon session in addition to the regular evening session, and it was evident that the change was a factor in bringing out the members. The meeting was called to order at 5:10 p. m., President Wm. H. Bense in the chair.

The committee on short weight of pig iron, coke and coal reported that it was progressing slowly and that plans were being formulated whereby it expected to hold a meeting at the Bellevue-Stratford hotel, Philadelphia, the date of which is to be decided upon later, and the members hope to bring together the representatives of the various transportation and coal companies, as well as those from the blast furnaces and coke ovens, and other foundrymen's associations. It was voted that a committee of three, to be chosen from the weight committee, be appointed to represent this association at the meeting to be held at Philadelphia.

A nominating committee consisting of Messrs. Carpenter, Shaw and Geo. H. Gibby was appointed to report at the next meeting when election of officers will be held.

W. F. Russell, of Gunn, Richards & Co., New York, gave a very interesting talk on obtaining costs in the foundry. The speaker told briefly how the cost on products could be obtained either as a whole or subdivided in classes, and the plan, if followed out, would show the manufacturer just what proportion, if any, of his output is being made at a loss.

After a short intermission, the meeting adjourned to dinner, after which the chairman introduced as the speaker of the evening, Walter M. Saunders, of Saunders & Franklin, chemists, Providence, R. I., who addressed the members on the subject, "Molding Sand," describing the gathering, shipping and some of its properties, illustrated by stereopticon. The speaker's remarks were followed very closely by the audience and at the conclusion of his talk a brief discussion followed.

The attention of the members was called to the annual meeting, which is to be held in Boston, Jan. 8. Arrangements for entertainment to be provided at this meeting are in the hands of the executive committee, and present indications point to greater success than at any previous occasions. There will be many special features, as well as addresses by prominent men, and a record-breaking attendance is expected.

New York Foundry Foremen.—Plans for increasing the membership and arousing greater enthusiasm among those already members were discussed by the New York branch of the Associated Foundry Foremen at its twenty-first meeting, held Nov. 30 at the Grand Union hotel, New York city. In the absence of President McPhee, the chair was occupied by the vice president, D. C. Wilson, of the M. W. Kellogg Co., Jersey City. Mr. Wilson spoke at considerable length on the necessity of strengthening the organization by an active campaign for new members, and his remarks were endorsed by those of the secretary-treasurer, J. C. Pangborn. Much enthusiasm was aroused among the nine visitors in attendance, many questions being asked in regard to the organization. No papers were presented at this meeting, but there was considerable discussion on topics of general interest. Ten members were present.

LITTLE CHANGE IN THE SUSQUEHANNA VALLEY.

Harrisburg, Pa., Dec. 17.—Affairs in the Susquehanna valley are much as they were a week ago. Most of the plants have cut operations to the minimum and while some orders are coming in, they are small. Considerable hopes are pinned to the rail orders which are soon to be placed and there are some inquiries heard about structural material.

An event of interest was the election held in the tool and machine companies at Waynesboro. The Frick company elected all of its old directors except I. E. Yost, who was formerly connected with the Emmert Tool Co., and who is identified with the Bank of Waynesboro. Six per cent dividend was declared. The Geiser Mfg. Co. declared 7 per cent dividend and re-elected all former directors. The Victor Tool Co. elected Jacob H. Strickler, president; T. Scott Cunningham, vice president, and U. Grant Bishop, secretary and treasurer, two changes being made.

The Pennsylvania Steel Co. has blown out its Lochiel furnace. The company has suspended three of its five furnaces in this county, one being banked. The Empire Steel & Iron Co. has also blown out its Topton furnace.

BUSINESS IS SLACK

And Unions Continue to Cause Trouble in San Francisco.

(Special Correspondence.)

San Francisco, Dec. 12.—"Business has not been so slack in the past five years, or longer, as it is just now," is what a prominent foundryman said this morning. By inquiry among the foundrymen, in the machine works and in the shops in which general work is done, the statement is confirmed. There is little work on hand, less ahead, and nothing on the books. The present condition contrasts materially with that prevailing only a few months ago, when business was quite brisk. The present condition is apparently brought about by the temporary stringency of money. Structural work continues, though less brisk than it has been for the past year and one-half. While much construction work is going on in all parts of the city, and the stranger upon arriving in town, is apt to be impressed with the large number of steel frames rising in every direction in the burned district, building activity is less brisk than it was a few months ago, though the falling off is not perceptible in the structural iron trades.

Persistent and systematic efforts are being made by the unionists of San Francisco and neighboring cities, through the labor press of the country and through labor organizations, to keep machinists, ship fitters, steam fitters, plumbers and other mechanics from coming to San Francisco, Mare Island navy yard, Benicia and Vallejo, the two latter cities being close to the government navy yard. The local unions, or at least their officers, leaders and business agents, have a quarrel with the federal authorities about piece work. The work is eagerly sought by mechanics and workmen; the pay is fair, the hours short, and living in Vallejo or Benicia very pleasant, and at moderate cost. The government officials clamor for more workmen and have to import hundreds of them from other navy yards, while the union leaders say that they can furnish all the men required from nearby towns. The officials say that they want men who will work, but will not continue men on the pay roll who refuse to work and keep others from working.

Reeves & Co., Columbus, Ind., have reopened their plant and factories suming.

PERSONALS.

David Marker, master mechanic of the Gautier works of the Cambria Steel Co., Johnstown, Pa., has been promoted to the position of assistant superintendent of the Gautier mill. Clarence Meteser, formerly connected with the engineering department, has been made master mechanic.

George P. Brown has retired from active business life after serving 36 consecutive years with the Pullman Co. Mr. Brown at his retirement was treasurer of the company and was once its general manager. He has been succeeded as treasurer by K. Demanler.

Sterling W Dickson, paymaster at the Berwick car works under the old Jackson and Woodin Co., and later under the American Car & Foundry Co., has resigned to take effect on Feb. 1. He had been connected with the works for 37 years.

Henry R. Rea, of the Oliver Iron & Steel Co., Pittsburg, is suffering at his home on Sewickley Heights from severe injuries recently sustained in an automobile accident.

R. H. Sweetser has resigned as superintendent of blast furnaces of the Algoma Steel Co., Sault Ste. Marie, Ont., to become superintendent of the Columbus Iron & Steel Co., Columbus, O.

W. H. S. Bateman, connected for a number of years with the Lukens Iron & Steel Co., Coatesville, Pa., and recently southern sales agent for the Chicago Pneumatic Tool Co., has assumed the position of general and southern sales agent for the Champion Rivet Co., Cleveland, with headquarters at Philadelphia. Mr. Bateman will look after the interests of the Champion Victor rivets in eastern Pennsylvania, western New York, and the southern states.

George D. Wadley, general manager of the Atlanta, Birmingham & Atlantic Railroad Co., has been made manager of the South Atlantic Car & Mfg. Co., Waycross, Ga., and has also been placed upon the executive committee. J. E. Cameron, former master mechanic, and M. R. Catherwood, former purchasing agent of the railroad company, were also given important positions with the car company.

John R. Scott has been appointed manager of sales for the Cleveland district of the Tennessee Coal, Iron & Railroad Co., with headquarters at 1610 Rockefeller building. R. S. LeBarre has been named assistant manager of sales. Foundry pig iron will be the chief product of the Tennessee company handled in the Cleveland territory.

Lucian Brown, purchasing agent for the Ralston Steel Car Co., Columbus, O., after Jan. 1 will be located at the New York offices of that company, 2 Rector Place, where he will be in charge of sales and will continue as purchasing agent.

John E. Woods, sales agent of the Carnegie Steel Co., Cincinnati, will represent the Tennessee Coal, Iron & Railroad Co. in the selling of its pig iron in southern Indiana, including Indianapolis, southern Ohio, including Columbus, and Kentucky, taking effect at once.

DOMINION COMPANY ACQUIRES COAL LAND.

(Special Correspondence.)

Toronto, Dec. 16.—J. H. Plummer and F. P. Jones, respectively president and manager of the Dominion Iron & Steel Co., Sydney, N. S., have secured the coal areas at Cow Bay, N. S., of the Cumberland Railway & Coal Co., of which Sir George Drummond, of Montreal, is president. These deposits comprising about 30 square miles of territory, are estimated to contain about 150,000,000 tons of coal, and are located about 10 miles from the Dominion Steel company's plant. It is the intention to form a new company to take them over, which will be controlled by the steel company. It is hoped to mine sufficient coal from this field in two years to furnish a supply for the Sydney plant. The hearing of the appeal in the suit of the Dominion Iron & Steel Co. against the Dominion Coal Co. began at Halifax, N. S., on Dec. 16.

The industrial situation in Toronto shows no noticeable change since last week. No further reductions in working staffs have been reported. The numbers of the unemployed, however, continue to be swollen by the arrival here of many recent immigrants and others thrown out of work at other points. Among the latter are a number of iron workers. In Ottawa many of the factories are laying off men. The Canadian Ship Building Co. resumed operations in its yards at Bridgeburg, Ont., after having been closed down for several weeks. About 250 men were taken on.

Word has been received at the general offices of the Pennsylvania lines in Columbus, O., that the shops of the Cleveland, Akron & Columbus railroad will be moved from Mt. Vernon, O., to Orrville, O. Deeds have been filed showing the purchase of nine acres at Orrville for that purpose.

GETTING TOGETHER.

Buffalo Employers Take Preliminary Step Toward Organizing.

(Special Correspondence.)

Buffalo, Dec. 16.—The formation of a federation of the various employers' organizations of Buffalo and the Niagara frontier was given an impetus last Thursday night at a banquet of the Buffalo Foundrymen's Association, the Buffalo Metal Trades Association and the Buffalo Boiler Makers' Association.

The matter of carrying on the work of organization was placed in the hands of committees, the concensus of opinion being that it should be placed upon its feet at once. It is expected that a membership of from 300 to 400 can be obtained.

One of the possible benefits of such a federation, it is pointed out, might be the maintenance of such a free employment bureau as is now conducted so successfully by the organizations which gave the banquet and started the project.

Among the speakers at the dinner were James A. Emery, secretary of the Citizens' Industrial Association of America, New York; John J. Whirl, secretary of the Employers' Association of Detroit; and John Trix, vice president of the latter. These men explained how such organizations worked in other cities and the benefits which have come to concerns which have joined hands in a common cause for their own protection.

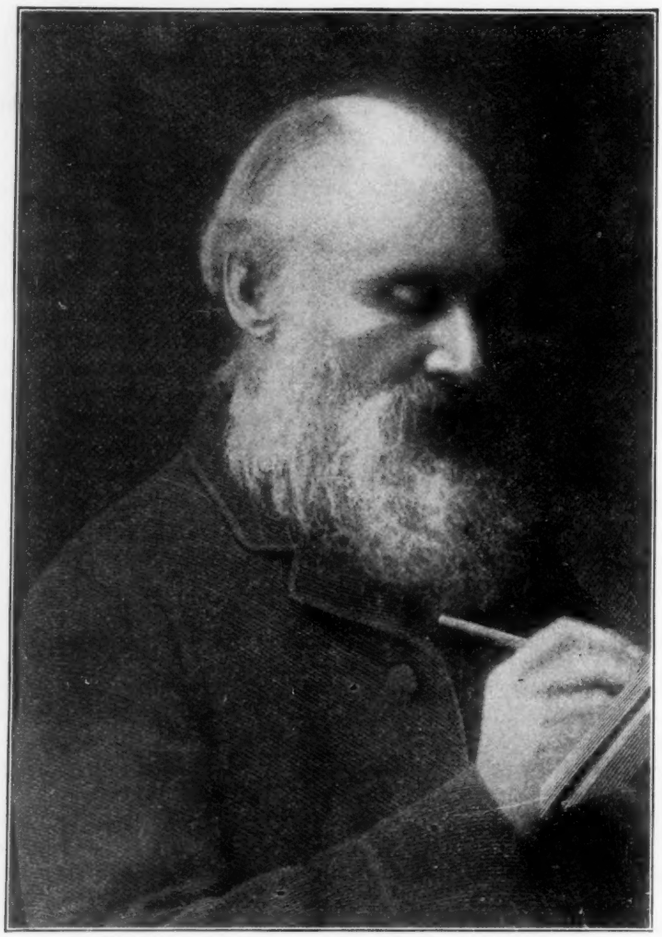
Award Pumping Contract.—Bids were opened by the city of Atlanta, Nov. 25, for one 20,000,000-gallon vertical triple expansion crank and fly wheel pumping engine with a guaranteed duty of not less than 170,000,000 foot pounds per 1,000 pounds of dry steam. The following bids were tendered: Allis-Chalmers Co., 60-inch stroke, $134,000; Allis-Chalmers Co., 66-inch stroke, $149,300; Bethlehem Steel Co., 66-inch stroke, $132,000; Camden Iron Works (R. D. Wood & Co.), 66-inch stroke, $147,700; Holly Mfg. Co., 66-inch stroke, $156,000; William Tod Co., 66-inch stroke, $157,400; Wisconsin Engine Co., 60-inch stroke, $139,500. The following companies also bid upon centrifugal pumps, driven by steam turbines: Bethlehem Steel Co., $68,000; General Electric Co., $56,900; D'Olier, $39,500; Allis-Chalmers Co., $43,700. The contract has been awarded to the Wisconsin Engine Co. for the vertical triple expansion pump.

The new Jisco furnace of the Jackson Iron & Steel Co., Jackson, O., is expected to go into blast about Jan. 1.

LORD KELVIN DIES IN GLASGOW.

Lord Kelvin, the world's foremost scientist, died in Glasgow, on Dec. 17, after an illness of about a week.

Lord Kelvin was born in Belfast, Ireland, in 1824. He was the son of James Thomson and in his early manhood was known as William Thomson. At the age of ten, he entered the university of Glasgow, and after a brilliant career was in 1846 appointed professor of natural philosophy. He had at that time already published a number of papers chiefly on the theory of heat and static electricity, and had a wide reputation.



LORD KELVIN.

Lord Kelvin was actively connected with the success of the Atlantic cable, and it was by means of his instruments that on Aug. 6, 1858, the fact was established that it was practicable to send messages under the ocean. Numerous difficulties, however, attended the operation, and it was not until 1866 that permanent communication was established. As a result of Prof. Thomson's share in the final success of the undertaking, the honor of knighthood was conferred on him in 1866.

In later years, he made many inventions which improved the cable service. Among his other inventions were an improvement in the apparatus required for deep-sea soundings, a new mariner's compass and other instruments for navigation. It is in the field of electricity that Lord Kelvin made his greatest inventions. As a measuring instrument, the Kelvin balance is the most sensitive and accurate instrument in existence. Many other inventions of electrical measuring apparatus stand to his credit, covered mainly by the 16 master patents dating from 1881.

In 1890, he was appointed to the chairmanship of the International Niagara Commission, which examined, reported on and awarded prizes for plans for the generating and transmission of power from Niagara Falls.

In 1892, he was created Lord Kelvin, but as he leaves no heir, the title dies with him. In 1902, accompanied by Lady Kelvin, he made a visit to the United States.

Lord Kelvin was the first recipient of the John Fritz Medal, the award having been made to him in April, 1905, for "Cable Telegraphy and Other General Scientific Achievements."

OBITUARIES.

William S. Love, manager of the Wheeler Condenser & Engineering Co., New York, died at his home in Orange, N. J., Dec. 12, of pneumonia. He was 40 years old.

Frank Lee Zimmerman, Portland, Ore., for a long time connected with the Wolff & Swicker Iron Works and for the past seven years president of the Zimmerman-Wells-Brown Co., died Nov. 24, aged 39 years.

William A. Bindley, president and director of the Bindley Hardware Co. and of the Neely Nut & Bolt Co., Pittsburg, died at a hospital at Wilkinsburg, Pa., Dec. 12.

Charles Douglass, New York, one of the pioneers in the manufacture of barb wire, having long been president of the Iowa Barb Wire Co., which was ultimately absorbed by the American Steel & Wire Co., of which he became a director, died Dec. 4, aged 78 years.

George J. Humbert, promoter, financier and inventor, died suddenly from heart failure, Dec. 11, at his home in Connellsville, Pa., aged 50 years. Mr. Humbert had devoted a considerable portion of his life to iron and steel enterprises. He first entered the employ of the Pittsburg Bessemer Steel Co., at Homestead, and there soon became assistant manager. In 1880 he went to Colorado to assume charge of the western department of the Bessemer company, but returned to Pittsburg in 1885. Later he became superintendent of the Glasgow Iron Co., Pottstown, Pa., supervising the construction of the Bessemer Steel Works at Chester, Pa., and from there became president and general manager of the Norristown Steel Co., Norristown, Pa. After the latter plant was sold in 1894 to the American Steel Casting Co., which he organized, he came to Connellsville, and there was prominent in numerous business undertakings until his death. He started the Humbert branch of the American Sheet & Tin Plate Co., at Connellsville, and became manager of the eastern district of the company. At the time of his death he was president of the American Aluminum Coating Co.

William B. Munnis, aged 42, died Dec. 4 at his home near Pittsburg. At the time of his death he was vice president and general manager of George A. Jelley & Co., foundrymen, and in late years had been connected with the Carnegie Steel Co., the Lewis Foundry & Machine Co. and other interests.

COKE DRAWING MACHINES—I.[1]

And Other Machinery for Use at the Ovens in the Manufacture of Coke.

BY WALTER W. MACFARREN, [2]

"In the United States the manufacture of coke has hitherto been confined mainly to localities affording the best quality of coking coals. It required little skill to make excellent coke from such good coals, but with the large expansion of the coke industry and the gradual exhaustion of the areas of the prime coking coals, compelling the use of the secondary qualities of coking coals," improved forms of ovens, and various mechanical devices for supplanting hand labor have become necessary and desirable, owing to the increasing difficulties of coke manufacture from the inferior coals.

The manufacture of coke in the United States began in a feeble way, with four small establishments, in the year 1850. In 1892 there were 261 coke plants, with a total of 40,000 ovens, and the total value of the product was $23,500,000, at the ovens. In 1902 there was produced 25,400,000 tons of coke, of an average value at the ovens of $2.49 per ton, or a total value for the year of over $63,000,000. To produce this coke there was required about 40,000,000 tons of coal, or an acreage of coal land of about 4,000 acres. On April 1, 1907, according to tables published by the *Connellsville Courier*, there were in the Connellsville and lower Connellsville regions a total of 37,000 ovens, in round numbers, with over 2,000 additional ovens projected or building.

Assuming that only 35,000 of these ovens are in constant operation, their combined daily output would be over 70,000 tons of coke, requiring over 100,000 tons of coal, or about 10 acres per day, for the Connellsville region alone. Of this total output only about 3,000 ovens are machine-drawn at this writing. It will thus be seen that the field for a good coke drawing machine is large.

Forms of Ovens.

The many forms of coke ovens can be broadly classified under two heads, the rectangular oven and the bee hive.

Ovens of the rectangular forms are almost exclusively used for making *by-product coke*. Also lately, the long ovens, having a width of from 4½ to 8 feet and a length of 30 to 33 feet, are again coming into vogue, on account of the lessened labor cost, due to the easy application of machinery to replace hand labor. These machines will be more fully described hereafter. Of all the ovens making "Connellsville coke," less than a hundred are of this form, at this writing.

The great majority of all coke ovens are of the bee-hive type. The standard bee-hive oven is 12 to 13 feet diameter, about 7½ to 8 feet high in the center, has an opening at the top called the "trunnel head," for introducing the coal, and a door at the side, for the extraction of the coke.

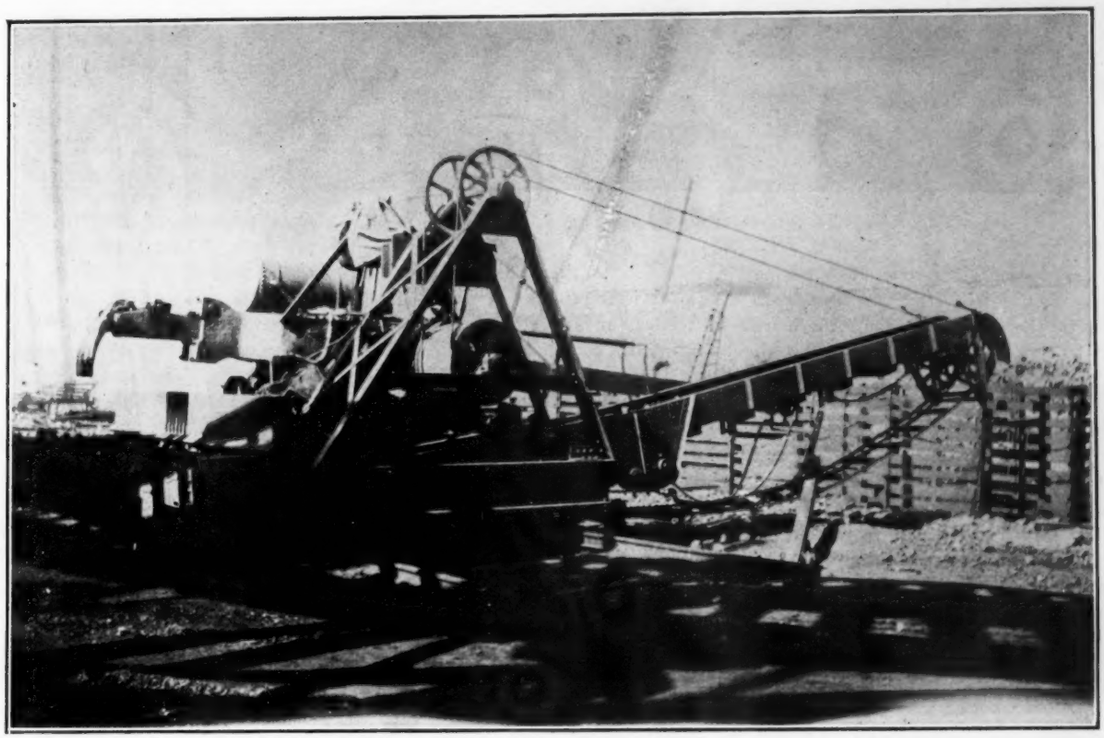


FIG. 1—ALLIANCE MACHINE AT CONTINENTAL NO. 1.

For hand-drawing the doors are usually about 2 feet 6 inches wide and 3 feet 3 inches high.

For machine ovens the doors are about 44 inches wide by 3 feet to 3 feet 6 inches high.

The bottom of the ovens is floored with tile, 12 inches square by 4 inches thick.

Process of Coke Manufacture.

The coal is charged in the trunnel head from a "larry" above the ovens. It is then leveled by hand, with a scraper. The door is then bricked up and luted with clay, leaving the proper air space

[1]Abstract of a paper read before the Engineers' Society of Western Pennsylvania, Oct. 1, 1907.

[2]Mechanical engineer for Bollinger Bros., Pittsburg.

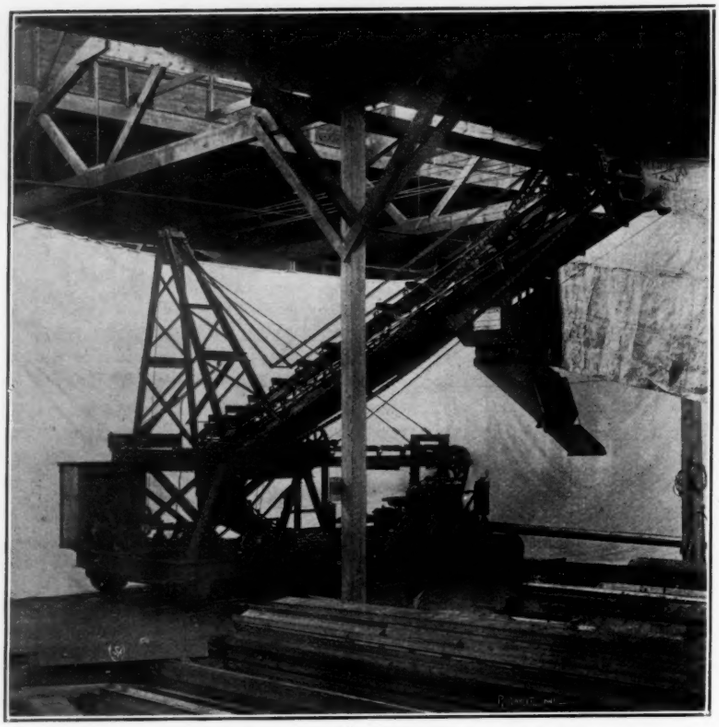


FIG. 2—THE MARMAC MACHINE.

for entrance of air above. The coking process then starts from the heat contained in the oven walls and continues from 40 to 70 hours. The amount of coal charged depends upon the length of time it is to coke. When the coking process is complete, usually 44 to 46 hours after charging, the door is removed and the oven quenched or watered by hand with a hose. The oven is then drawn and recharged as soon thereafter as operating conditions permit.

Structure and Physical Properties of the Coke.

After the coking process is completed, the coke stands in the oven divided by substantially vertical strata or seams. A thin layer of ash covers the top. The best coke is extremely hard and brittle. The dust of the coke is comparable only to emery in its destructive action on machinery. The coke, as it stands in the oven, is in a solid mass, with the exception of the vertical strata referred to, and these are close-fitting and locked together.

To illustrate this, the writer has seen a charge of coke pushed from a rectangular oven 5 feet wide and 30 feet long, onto a flat platform made of oak planks, on the level of the oven bottoms, with only a hatful of coke spawling off the sides. This coke had to be separated with a pick to enable it to be forked into cars.

Drawing Coke by Hand.

From the above, it will be seen that the process of drawing coke by hand involves the hardest kind of manual labor. In addition to the resistance offered by the coke itself, the snow, cold and slush of winter, and the heat of the sun in summer, in combination with the heat from the ovens, together with the dust and fumes in all seasons—combine to render the work of extreme difficulty. Few Americans would work at it and with the continued expansion of the coke industry, the class of labor which will stay at it, becomes increasingly difficult to obtain.

W. H. Clingerman, general superintendent of the H. C. Frick Coke Co., said lately to the writer on this point: "The coke drawing machine has come to stay. It is not only the direct saving in cost of production shown by the machine plants, but the labor to draw by hand can no longer be obtained."

Saving in Time by Coke Drawing Machine.

The average time required to draw an oven by hand is about three hours. The average by existing machines is well within 15 minutes. There is thus a saving of 2¾ hours, which, if utilized, can be made to produce about 5 per cent more coke. Much of the possible saving in time is lost, however, in present practice, by antiquated methods of watering and delay in recharging the ovens. The time lost between watering the coke in the oven and the introduction of fresh coal for coking, is a loss in two ways: First, it is a direct loss *per se*. Second, with the door open and the coke watered, every minute the oven stands it loses heat by radiation, so that the coking process starts so much slower after the new coal is introduced.

Saving in Cost of Drawing by Machine.

The coke drawing machine saves money directly over hand drawing. The scale price for hand drawing is $1.12 per oven. The machine will do this for less than half.

At the Frick Coke Co.'s Continental No. 1 plant private tests were made, covering a year's operation, which showed the cost of hand drawing to be $1.14, and of machine drawing (including repairs to machines and ovens, and a sinking fund to cover cost of the machine), to be 52 cents per oven, a saving of 62 cents per oven. These figures are believed to be reliable, but they cannot be officially confirmed.

At the rate of 50 ovens per day per machine, this saving would amount to $30.00 per year. The saving on the 18,000 ovens drawn per day in the region, at 50 cents

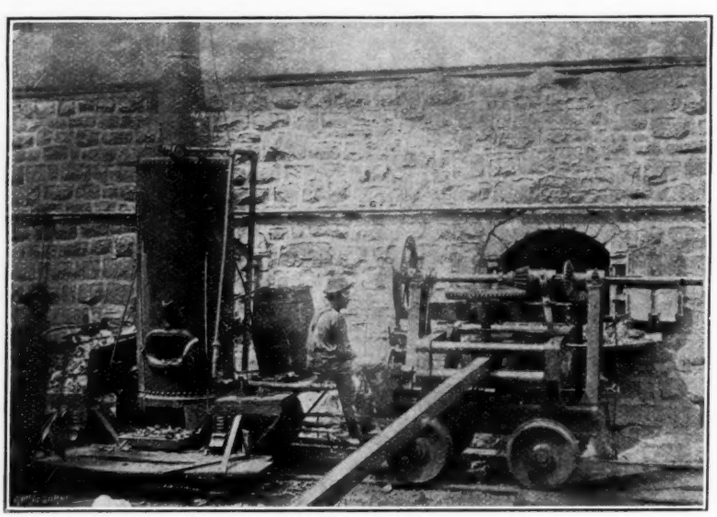


FIG. 3—THE FIRST COVINGTON MACHINE, STEAM-DRIVEN, INSTALLED AT LOW MOOR IRON CO. IN 1901.

FIG. 4—LATE COVINGTON MACHINE AT WYNN. NOTE MOVING PLATFORM NECESSARY FOR LEVELING.

per oven, would be $9,000 per day, or nearly $3,000,000 annually.

Size of Coke Drawn.

By hand drawing the coke is drawn from the oven in nearly its original size as coked, and a considerable portion of it reaches the railroad car in this state. All coke drawing machines break up the coke more or less in the extraction, and still more in conveying it to the car. This has been one of the principal objections to the introduction of the machines. However, when it is considered that the coke drops from 4 to 10 feet into a car, is transported several hundred miles to destination, and then often passes through coke bins requiring further drop, it is seen that, in many cases, it is of necessity small when used. R. M. Waite, late assistant to the president of the Colorado Fuel & Iron Co., told the writer that the total drop or fall of their coke, in several successive handlings from ovens to furnace, was in the neighborhood of 70 feet.

A great deal of opposition to machine coke has been the result of prejudice and some furnace men admit the superiority of a smaller uniform product over a mixed product of large and small pieces. The very fine coke or breeze is usually a dead loss, although in some cases it can be sold for domestic use.

The following data on breeze coke are supplied by R. L. Martine Jr., assistant manager of the Bessemer Coke Co., as illustrating the practice at the Griffin plant:

Breeze coke from hand-drawn ovens, 600 pounds; breeze coke from Marmac machine, 950 pounds; breeze coke from Covington machine, 1,300 pounds.

The problem to be met in the design of a coke drawing machine is thus seen to be of no small size and in support of this assertion, it is on record that there have been many failures in this line.

The essentials of a good coke drawing machine may be stated as follows:

First—Reliability. After the machine is installed and the labor gone, the output of the plant depends on the machines.

Second—Capacity. A machine which will draw 50 ovens to another machine's 40 in the same time, is, of course, the better.

Third—Economy of operation. This would include the items of power, operating labor, maintenance, interest on first cost, etc.

Fourth—The delivery of large, clean coke to the cars.

Fifth—A low construction of machine or a "high" yard, permitting the drawing of the coke by hand when occasion required.

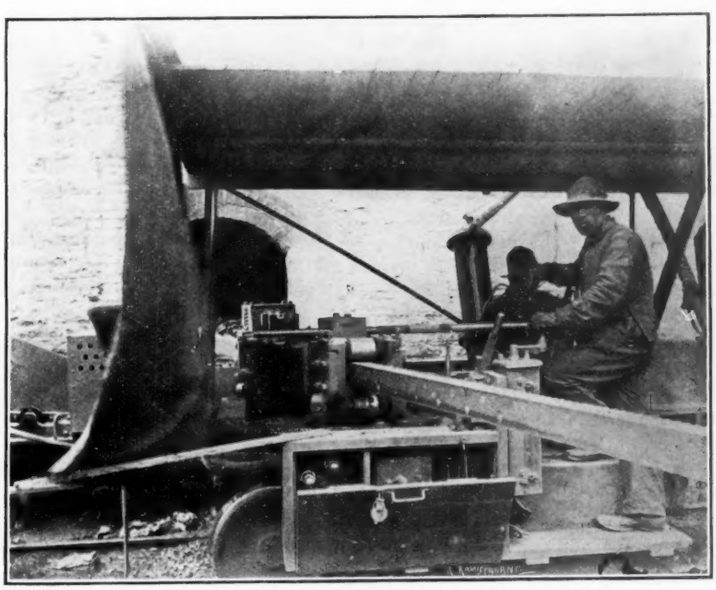


FIG. 5—COVINGTON MACHINE AT GRIFFIN.

Sixth—As nearly "fool proof" as possible.

Seventh—Low first cost of machine and installation.

The writer believes the relative importance of these factors to be about in the order stated—in other words, the first cost of the machine is the last thing to be considered.

Existing Machines.

The coke drawing machines existing at the present time, as far as known by the writer, may be divided into two classes, with relation to their method of attacking the coke, viz.: The over drawing machines and the under drawing machines.

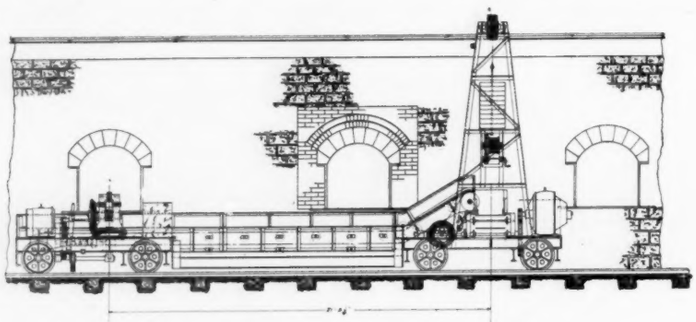


FIG. 6—HEYL & PATTERSON MACHINE, FRONT ELEVATION.

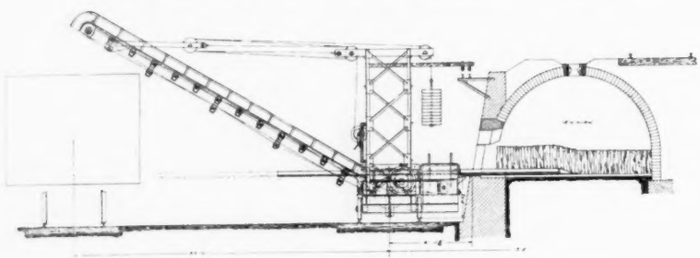


FIG. 7—HEYL & PATTERSON MACHINE, SIDE ELEVATION.

To the first class belong the Hebb machine and the machine at Continental No. 1 plant, H. C. Frick Coke Co., designed by Fred Danniels, chief engineer of the American Steel & Wire Co. To the second class belong the Covington, the Heyl & Patterson and the Marmac. These three latter machines use the Smith under working shovel in its original form.

The Hebb Machine.

The Hebb machine was described in *"Mines and Minerals,"* February, 1904. None of these machines are at present in use, but one is under construction for Jones & Laughlin.

The Alliance Machine.

The Alliance machine is broadly a copy of the Hebb machine, with variations in details. It has three electric motors, three air cylinders and an air compressor. The ram bar enters over the coke and has a set of hinged fingers which enter the oven horizontally and are pulled down on the coke by an air cylinder at the rear end of ram. The ram has a vertical tilting adjustment, power operated, by means of two air cylinders. The ram and its operating mechanism are carried on a turntable, rotated by a motor.

The Covington Machine.

The Covington coke drawing and loading machine was the first "complete" coke drawing machine to attain any degree of success.

It can thus lay no claims to originality, but it was the first coke drawing machine to do the work—that is, to remove coke from an oven and place it in a railroad car without manual handling.

As shown in the accompanying illustrations, the machine consists of an extractor and a conveyor. The extractor is operated by a 20-horsepower motor, there being six gears between the motor and ram. The ram carriage is pivoted about the center line of the vertical driving shaft, to allow of pointing it in the direction desired. This swinging is obtained by a hand wheel and screw.

This feature of the machine makes it necessary that there be two men to run it, as one operator cannot stand the combined heat, dust and labor of swinging the ram continuously. The form of ram drive (from below) and conveyor make necessary a distance of 3 feet 5 inches from oven seat (floor of oven) to the top of rail. This renders it extremely difficult to draw the ovens by hand, the desired height of yard for this purpose being 2 feet 6 inches below oven seat. It also entails additional expense in installation, as in old plants about 15 to 18 inches has to be graded out for the machine track. In new plants the same amount of masonry has to be built.

The Covington machine is cheaply constructed. Except for a small amount of structural steel, the greater part of the machine is built of cast iron. In the writer's opinion, there should be no cast iron used in the extractor.

The ram driving gears on the Covington machine are, of necessity, steel, and it is a wonder that they stand the service at that. Nothing in the writer's experience, including several years in rolling mills, shows anything to equal the terrific back lash in these gears. The ram is driven by a reversing motor, having a drum type controller, with notches on both sides of the central "off-point." There are three sets of gears in the train, the spur armature pinion and its gear, a bevel pinion and its gear, and the rack pinion and rack. In full operation the motor is reversed, upwards to 20 times a minute.

The conveyor consists of two parts at right angles. The first part extends under the oven door and receives the coke as it is withdrawn by the extractor. This conveyor is level under the oven door, and then rises about 18 inches to the point of discharge, where the coke falls onto the loading conveyor. Both these conveyors are of the "apron" type and carry the coke on their upper strand. The receiving conveyor has flights close together and carries coke and ashes, but the loading conveyor has flights about 2 inches wide, with 3/8 to 5/8 inches space between, to screen out the ashes and fine coke. The loading conveyor is carried by small idler sprockets, about 4 feet apart, and the screening action is very perfect owing to the vibration and curving of the conveyor. In fact, the conveyor sometimes loses small coke between the flights and the stationary side guards, and makes more breeze coke than is desirable. The loading conveyor is adjustable vertically to suit different heights of cars. It has no adjustment laterally. Coke can be delivered only off the end of the conveyor. Both conveyors are driven by a 10-horsepower enclosed motor. The drive for track wheels is from the extractor motor by means of a crab clutch. Although the extractor brings out the coke intermittently, a bushel or two at a time, the loading conveyor delivers the coke to the car in a practically constant stream.

Owing to the fact that the vertical pivot around which the ram swings is located about 7 feet from the oven door, it is necessary to make three settings of the machine to reach all the coke in the oven; first centrally in front of the door; second, about 2 feet to the right to reach the coke on the left, and lastly, about 2 feet to the left, to reach the coke on

the right. This involves some loss of time. According to Enoch H. Abrahams, the Covington machine has made records as follows: Forty ovens in five hours, 112 ovens in 16 hours, 40,000 ovens for three machines in one year. The average speed of the machine, under favorable conditions, is about four ovens per hour. At the Griffin plant of the Bessemer Coke Co. they are regularly drawing 50 ovens per day in from 12 to 13 hours.

Fred C. Keighley, general superintendent, Oliver & Snyder Steel Co., writes as follows: "We have two Covington machines at the Oliver No. 1 plant; their average work is 40 ovens per day per machine. They can do this work in 10 hours when there are no interruptions. We have two of these machines at our Oliver No. 3 plant. The ovens there are 13 feet diameter, while the ovens at No. 1 are only 12 ft. diameter. We find that the machines at No. 3 can draw 40 ovens a day, but it takes probably an hour a day longer on account of the greater capacity of the ovens."

The machine draws upwards of 90 per cent of the coke in the oven, the remainder lying scattered on the oven floor. This is removed by hand. In order to draw it directly into the conveyor, the receiving conveyor on the later machines has been extended to take in two oven doors.

The Heyl & Patterson Machine.

The Pittsburg firm of Heyl & Patterson are planning competition on direct lines. This machine is practically a copy of the Covington, with the exception of details, which are better worked out. All the faults in principle inherent in the Covington machine are, however, faithfully preserved.

Both the Covington and the Heyl & Patterson machines have a practically rigid wheel base over 20 feet long, so that a turntable is necessary to transpose them for operation on both sides of a block of ovens.

As the Heyl & Patterson machine is so nearly like the Covington in design, no extended description will be necessary. The track gage and the height of rail below oven seat have been exactly duplicated, and it would seem that the machine has been designed as a substitute for the Covington, on the very yards it now operates on.

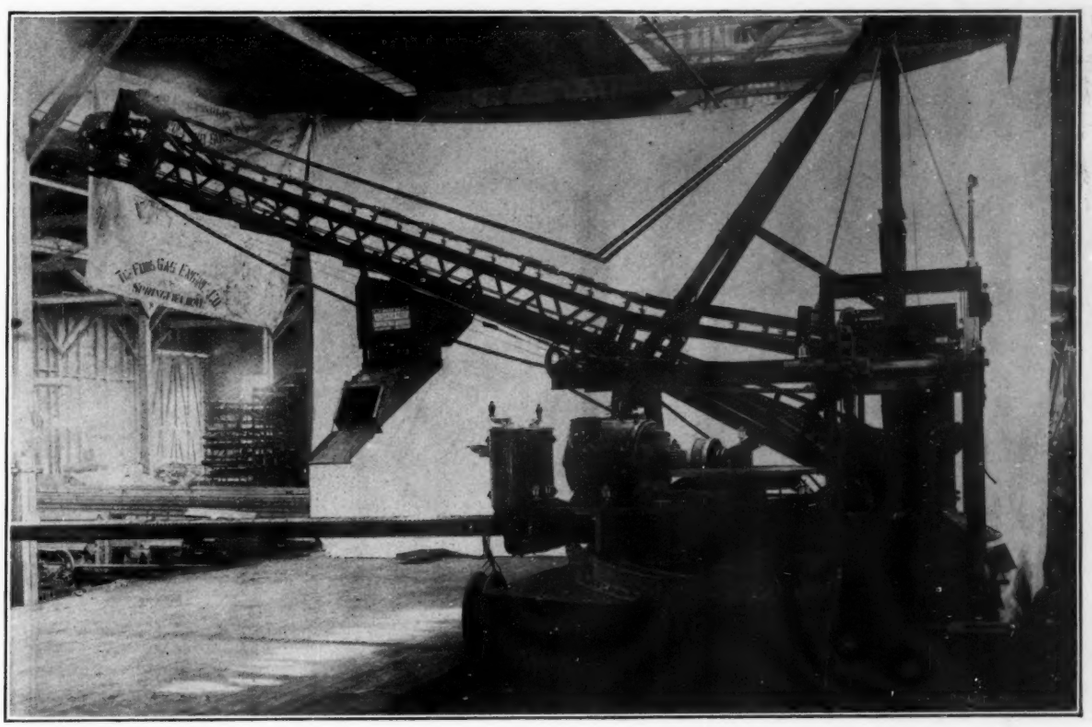


FIG. 8—THE MARMAC MACHINE, FROM EXTRACTOR END.

The Marmac Coke Drawing and Loading Machine.

The Marmac machine is a direct result of the faults of the Covington. It was invented jointly by R. L. Martin Jr., of the Bessemer Coke Co., and the writer, and designed by the writer. Only one machine has been placed in service, but others are now under course of construction.

In general principles, it is similar to the Covington, to the extent of having an extractor and a conveyor. The extractor is fitted with a rack driven ram and the Smith shovel. Here the resemblance ceases. The method of driving and swinging the ram, and of driving the track wheels, is new. The conveyor is unique. All the prominent features of this machine are protected by patents.

This machine consists of an extractor and a conveyor, each separately and independently mounted on its own truck and connected to each other by a draw bar. The extractor draws the coke from the ovens, from whence it falls on the conveyor. The conveyor receives the coke from the extractor and delivers the same to the yard or a railroad car.

Upon the extractor truck are mounted two motors, one for reciprocating the ram, and another for swinging it. Upon the conveyor truck is mounted a single motor, which is connected at will either with the conveyor, or to the track wheels on the conveyor truck, so as to move the whole machine along the track. These three motors provide power for the four motions of the machine, viz.: The reciprocation of the ram, swinging of same, driving the conveyor, and moving the machine along the track. It is to be noted that all these motions are driven by friction clutches, so that there is a yielding point between the driving motor and the driven machinery in each and every case. The machines are designed to deliver coke into a car on a track 40 feet from the face of the ovens.

The track in front of the ovens, on which the machine runs, is tilted to the same slope as the bottom of the ovens, in order that the ram may work parallel therewith. The extractor truck consists of steel framing, mounted on four track wheels. The side beams of the truck are

15-inch channels at 42 pounds per foot. The intermediate cross channels are 15 inches at 33 pounds, rigidly framed into the side beams. Entirely covering these beams and channels there is a ⅜-inch steel plate, forming a platform to receive the operating mechanism. The axles extend through the web of the beams and are supported in steel waste-packed axle boxes, similar to standard railway type, and having brass bearings. The axles are 4 inches diameter, cold rolled steel, and the axle brasses are 12 inches long.

The track wheels for the extractor are cast steel, bored and fitted to axles, but are not finished on the treads. The wheels on the outside rail are 20 inches diameter by 3 inches face, with double flanges. The axles at this side of the truck are reduced to 3¾ inches diameter, wheels bored to suit the same and clamped to the axles with a washer and a 2-inch nut. The track wheels on the inside rail are 20 inches diameter by 8-inch face, without flanges. They are bored to a neat fit on the axles and fastened to same by 1¼-inch pins. This construction puts all the strain of the ram action on the outside rail.

The truck also depends for accuracy of alignment solely on the outside rail, and as the double flanges on the outside track wheels are a practically neat fit on this rail, and the wheels on the other side of the truck are plain, a much more accurate alignment of the truck on the track is secured by this construction.

The horizontal swinging of the shovel in the oven is obtained by swinging the ram about an imaginary center, practically at the center of the oven door. In order to obtain this action, the ram with its driving motor and carriage, is mounted on a pair of curved guides, rigidly riveted to the top plate of truck. The rear guide, taking the thrust of the entering ram, is composed of a 6 x 6 x 1-inch rolled steel angle, and the front guide receiving the pull of the outcoming ram consists of a 6 x 6 x ¾-inch angle.

Mounted above these angle guides is a heavy steel casting, which serves as a bed plate for the motor and gearing, and as a guiding frame for the ram. At the extreme outside corners of this casting there are two steel rollers, mounted on vertical pins, the same engaging the curved angle guides on the truck. These rollers constrain the ram to move at all times in lines radiating from the imaginary center at the oven door. Just inside of these rollers are two other rollers mounted on horizontal pins, which roll on the top plate, between the curved guides, and carry the major portion of the weight of ram, motor, gearing, etc. The motor and gearing are arranged on the opposite sides of the center line of the ram, in order to distribute the weight equally on these two rollers.

In order to support the weight of the ram when it is near the oven door, there is provided a roller directly under the center line of the ram, and approximately at the outside edge of the truck, being supported by a steel carrier having interposed between it and the main guide casting, a pair of strong helical compression springs. At the front and rear ends of the ram guide casting there are four rollers surrounding and guiding the ram, one of these being under, one over and one at each side of same.

The ram is composed of a piece of double extra strong steel pipe 5 9/16 inches outside diameter by 4 1/16 inches inside diameter. At one side of this pipe there is riveted a cast steel rack, 4½-inch face, made in seven sections, each 3 feet long. These rack sections are fastened to the pipe by ⅞-inch taper threaded boiler patch bolts, 6-inch pitch, with countersunk heads, cold riveted into flanges on the rack sections. Both ends of the ram are turned to fit the shovel, so the ram may be reversed when worn.

The ram is reciprocated by a 25-horsepower, 220-volt series-wound motor, railway type, fully enclosed, with single hand reversing controller of the drum type. Motor and controller are water and dustproof. The armature pinion is of forged steel 5 1/3-inch pitch diameter, 5-inch face, and is loose on the armature shaft. The armature shaft is extended beyond the pinion to carry a special multiple disc dustproof friction clutch, one member of which is keyed to the armature shaft and the other bolted to the flange on the pinion. This clutch is fully enclosed. The friction surfaces are of metal, run-

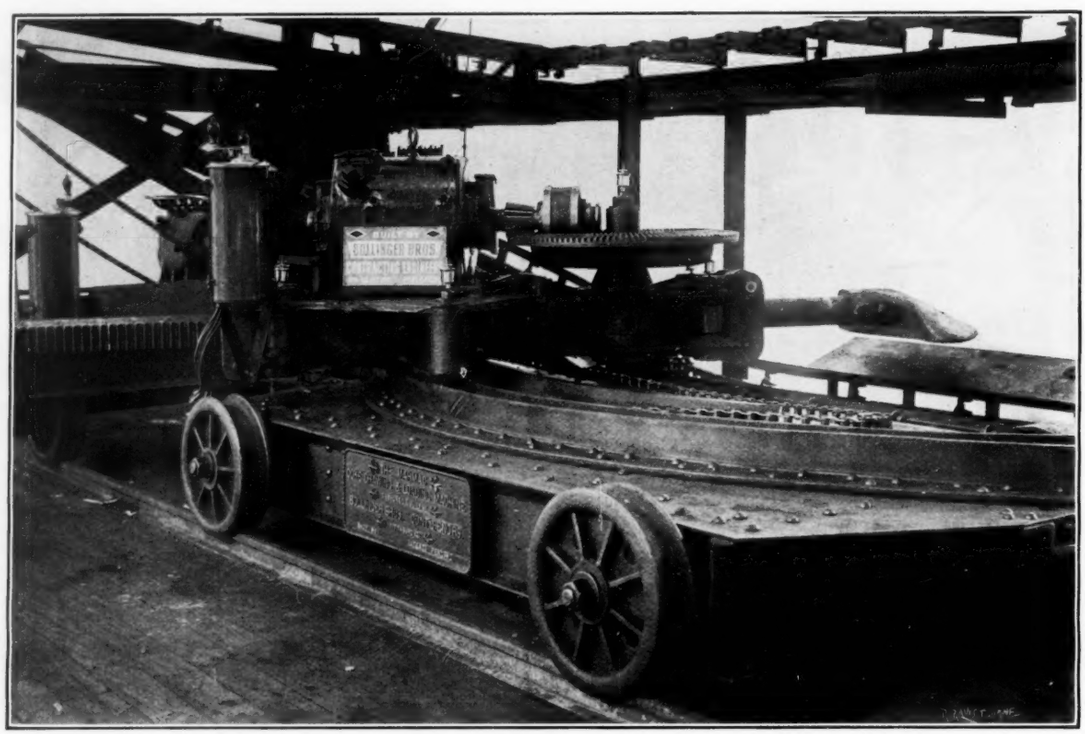


FIG. 9—THE MARMAC EXTRACTOR. RAM CARRIAGE SWUNG TO EXTREME LEFT.

ning in oil, and the clutch can be adjusted up to its capacity, to carry any desired load.

This construction makes the reciprocation of the ram practically "fool proof," as the operator cannot injure the machinery either by running the ram too far into the oven or back against the stop. It also minimizes the destructive action caused by the hammering of gear teeth on the reverse of motor.

The main driving gear for the ram is a cast steel bevel gear, mounted on the top of a vertical shaft, supported in two brass bushed cast steel dead eye bearings, flanged and bolted to the main guide casting. Between these bearings is located the cast steel double shrouded pinion driving the ram.

The motor for swinging ram is a 3¼-horsepower crane motor, 220 volts, fully enclosed, with single hand reversing controller. This motor is back geared by a pair of cut spur gears, the back gear shaft carries a cast steel bevel pinion, meshing with a cast steel bevel gear, 2½ inches, on a vertical shaft extending up through the top plate of the truck. On the top of this vertical shaft is a cast steel sprocket wheel, engaging a "roller pin" chain, which passes around an idler sprocket at the other end of the truck. Both ends of the chain are fastened to pins projecting from the under side of the main guide casting, with adjustments to take up the stretch of the chain. This chain is a duplicate of that used to drive the conveyor. By this mechanism the carriage or guide frame for ram can be rotated to any point within its travel by the simple movement of the controller handle.

This drive by the inclusion of a special dustproof friction clutch, also renders the operation of the swinging motion "fool proof," as no harm can be done to the machinery by swinging the carriage at full speed against the stops provided to limit its travel.

As it is necessary to shift the railroad car being loaded along its track, to keep it in the proper relation to the coke drawing machine, as it moves along in front of the ovens, we have provided a simple means of doing this by power taken from the ram motor, consisting of a cast steel hook riveted to the rear end of the ram, over which can be thrown a rope of chain, which is led around a snatch block or a snub post to the car.

The shovel is of cast steel in the shape of a curved wedge, the inside metal being cored out so as to leave 1½-inch thickness of metal all over the outside. This shovel has a boss at the rear, bored slightly smaller than the diameter of the ram pipe, which is turned to be a tight fit therein, and fastened by two bolts. The shovel is 40 inches long by 15 inches wide, and 8 inches thick at the rear.

To the inside of the extractor truck, between the ram and rear truck wheel, there is provided a cast steel swinging support for the overhanging end of the conveyor. This support is hinged so that it can be swung sideways against the truck frame when the extractor is being turned on the turntable, for instance, and is also provided with a vertical adjustment by which it can be set up to sustain the weight of the outer end of the conveyor. The tail end of the conveyor is to extend back to include the previous oven so that the coke remaining in the oven when the machine leaves it, may be drawn directly into the conveyor by hand.

This construction makes this end of the conveyor rigid under the falling coke. At the same time the conveyor is not fastened in any way to the extractor truck, so that if desired the extractor and the conveyor may be separately turned on a short turntable about 10 feet long.

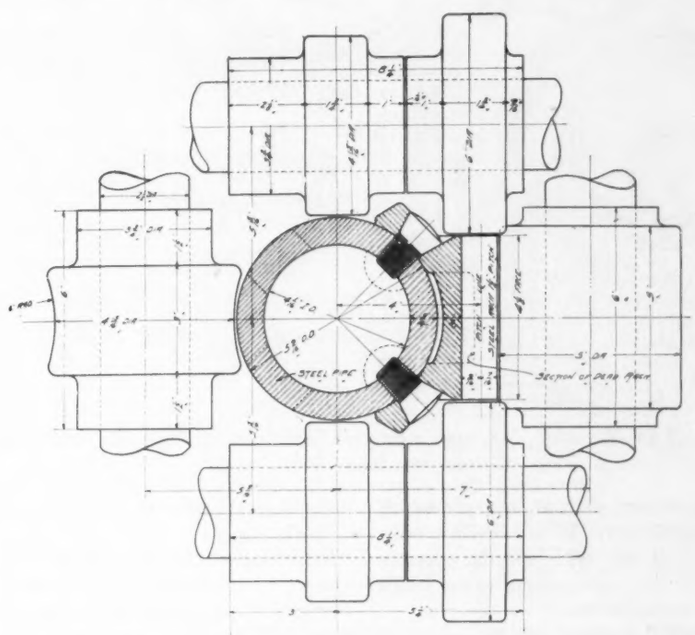


FIG. 10—THE MARMAC MACHINE. SECTION THROUGH RAM AND GUIDE ROLLERS.

The total weight of the extractor, including two controllers and resistance, for the two operating motors, is about 18,000 pounds.

The conveyor and its supporting structure are mounted on a truck having the same gage and wheel base as the extractor. The gage is 7 feet in center to center of rails, the wheel base is 8 feet. The distance between the centers of adjacent axles on the extractor and conveyor is 7 feet, making the total wheel base of combined trucks 23 feet.

The conveyor truck is built up of structural sections, with double flanged track wheels on the outside rail and plain track wheels on the inside rail, being made from the same patterns as the track wheels for the extractor.

The drive for the conveyor and for the track wheels of the conveyor truck is a 12½-horsepower, 220-volt, fully enclosed, shunt wound motor. The motor is set on a steel plate, on top of the conveyor truck at the extreme corner of the frame. This is done in order to utilize to the greatest possible degree the weight of the motor for balancing the overhang of the conveyor.

The armature shaft of the conveyor motor is extended beyond the center line of the truck, its outer end being supported in a ring oiling pillow block mounted on a cast iron stand. This shaft carries a cast steel machine-cut pinion, meshing with a split cast iron spur gear, mounted on a 2¼-inch shaft running the length of the truck.

This shaft is supported by four bearings and carries a pair of cast iron triple-threaded worms, located directly over and meshing with two cast steel worm wheels, each keyed to an axle. This arrangement drives all four wheels on the conveyor truck.

The drive for the conveyor proper is taken from a loose cast steel sprocket by a "roller pin" chain to a cast steel sprocket on a countershaft located about at the pivot point of the overhanging conveyor arm. This countershaft carries at its opposite end a cast steel sprocket, from which the drive is carried by a "roller pin" chain to a cast steel sprocket, located on the 3-inch head-shaft of the conveyor, which is mounted at the extreme end of the overhanging arm. The speeds of these separate shafts are as follows: Armature shaft, 900 revolu-

tions per minute; drive shaft for track wheels, 130 revolutions per minute; conveyor countershaft, 65 revolutions per minute; conveyor head shaft, 16.6 revolutions per minute. Speed of conveyor, 100 feet per minute. Speed of machine along track, 84 feet per minute. By means of a pair of friction clutches, located on opposite sides of the cast iron spur gear, the power is taken at will either to the track wheels or the conveyor. The motor is controlled by a reversing controller, so that the machine can be run in either direction upon the track by reversing the motor.

In addition to the above, there is a ratchet device between the driving sprocket on head shaft of conveyor, which will transmit power in one direction only, so that it is impossible for the operator to reverse the conveyor, no matter which way the motor is run.

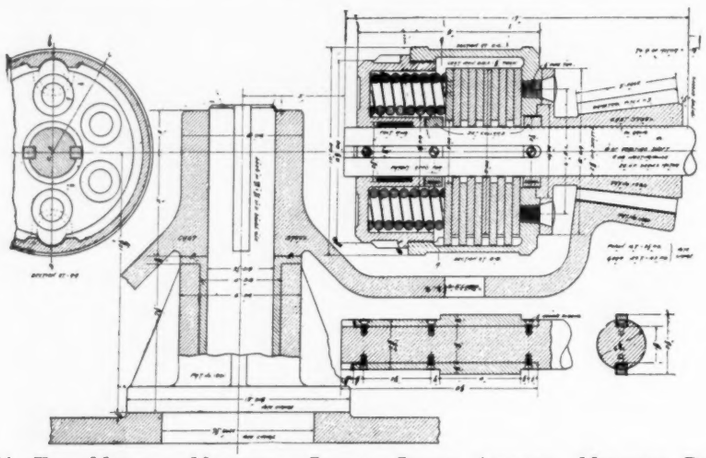


FIG. 11—THE MARMAC MACHINE. SPECIAL SPRING ADJUSTED MULTIPLE DISC CLUTCH ON RAM DRIVE.

The main supports for the conveyor consist of structural steel sections, mainly 6-inch channels, forming a tower. The overhanging framework at the head end of the conveyor is hinged to the supports so that it may be lowered from the extreme high position, to approximately a level position without interfering with the operation of the conveyor. This raising and lowering is effected by a worm-geared manually-operated winch, operating a ⅜-inch steel wire rope, reeved round suitable sheaves.

The conveyor proper consists of a single strand of special double-jointed chain and has steel flights 4 inches high, extending from one side only of the chain. The chain is driven from the outer end of the overhanging arm and drags the coke with a continuous smooth motion from the oven door to the point of delivery, with no intermediate fall or change from one conveyor to another.

The general contour of the conveyor is approximately that of an acute angled triangle with a sprocket at each corner thereof, it being located in two vertical planes with a right angled curve connecting them. The lower strand of the conveyor is the working strand. It extends horizontally from a point under the oven door for a distance of about 10 feet and then rises on a continuous even grade of 5 inches per foot to the delivery end, passing around a curve of 8 feet radius.

The return strand of the conveyor runs parallel to the working strand from the head shaft back to the pivot point of the overhanging arm and from thence around an 8-foot radius curve at a lesser grade than the working strand to a horizontal line above the oven door, from whence it drops vertically over the tail sprocket to the idler sprocket at the point of beginning.

Beginning at the pivot point and extending about 10 feet on the bottom of conveyor trough, there is a screen composed of 2 x ⅝-inch screen bars, spaced ⅝ inches apart, for the separation of the ashes and fine dust from the coke.

From the end of this screen to the end of the conveyor the bottom of the conveyor trough is composed of continuous hinged drop doors, about 2 feet square, permitting of the delivery of the coke at any one of these doors. This feature enables the product to be delivered either into the yard for storage or over the end of the conveyor into railroad cars. It also permits of the conveyor delivering into railroad cars on a curved or inclined track, which is at a varying distance from the front of the ovens, or to work successfully in two or more yards in which the track is at different distances from the ovens.

In connection with the overhanging arm of the conveyor there is a traveling trolley chute made of light steel plate and operated by a small winch on the conveyor truck. This chute can be placed under any of the drop doors, or at the extreme end of the conveyor. It also can be swiveled on a vertical pivot so as to deliver at any angle, to the yard or a car.

The conveyor chain is specially designed, consisting of alternate cast steel links and rolled bar links of 6-inch pitch. The pins for the articulation of the chain around the sprockets are made of 1¼-inch cold rolled steel, shouldered and riveted at one end into the bar links and shouldered and clamped by a nut at other end to bar links. By removing these nuts the chain is made detachable. The cast steel links are each made in two parts, with a vertical joint pin connecting same. The flights are spaced 24-inch centers.

The sides of the conveyor trough, excepting the boom, are composed of 8-inch channels, and to the outer one is fastened a ⅛ x 12-inch wearing plate.

The weight of the complete conveyor and operating mechanism is about 22,000 pounds.

(To be continued.)

AUSTRIAN IRON TRADE.

Consul J. I. Brittain, of Prague, sends the following summary of an address recently delivered before an iron and steel association on iron manufacturing in Austria:

The expansion of the Austrian iron trade would no doubt have been much greater were it not for the limited production of coke in the empire. There is a limited supply of coking coal; hence large quantities of coke must be imported from Germany and elsewhere. In 1906 the production of coke in Austria was only 1,700,000 tons, whereas Germany produced 20,300,000 tons. Austria imports annually 600,000 tons and exports 300,000 tons. The competing power of a country for the iron market of the world depends more largely upon the quality and quantity of mineral fuel than upon the richness of the ore deposits.

The annual consumption of iron in Austria is estimated at 110 pounds, in Germany 320 pounds, in Belgium 352 pounds, in England 440 pounds, and in America 704 pounds per capita. It is said that the principal reasons why Austria has retained her relative position as an iron-producing country are, first, her high protective duty; second, the amalgamation of plants under one management, thus reducing the cost of production. In the address the import dues on iron in the various countries was given, and the following are those of Austria per long ton: Pig iron, $3.05; black sheets, $18.27; beams, $14.20; rails, $12.18; rod iron, $12.18.

In connection with the high duty per ton on iron, attention is called to the high taxes paid the general government and other taxes, by the Prager Eisenindustrie Gesellschaft, conjointly with the Bohmische Montan Gesellschaft, which is under the same management. It is stated that these two companies have paid within the past eight years, or since the new tax law became effective, the sum of $4,433,520 in taxes, while the shareholders have received but $12,717,950.

THE ELIMINATION OF SMOKY CHIMNEYS

The committee appointed by the Syracuse Chamber of Commerce to investigate the subject of smoke abatement in that city has presented a report which is unusually complete and which considers all phases of the question. The report is not a one-sided affair, but considers fully and impartially the objections on the part of manufacturers to make changes in plant and equipment to lessen the smoke evil and shows that, in many cases, these objections are well founded. The committee is remarkable in that it is composed entirely of the highest technical talent probably ever placed on a committee of this character. The men composing it are as follows: John A. Mathews, chairman, the Crucible Steel Co. of America; John H. Barr, factory manager, the Smith Premier Typewriter Co.; W. H. Blauvelt, managing engineer, the Semet-Solvay Co.; Carleton A. Chase, the Syracuse Chilled Plow Co.; William Kent, dean of the College of Applied Science, Syracuse, University; J. D. Pennock, the Solvay Process Co.; John E. Sweet, president the Straight Line Engine Co.

The report is contained in a 42-page pamphlet, 6 x 9 inches, and is divided into eight sections: The Introduction, Principles of Combustion, Causes of Smoke, the Remedy, Railroad Smoke, Devices Must be Carefully Handled, the Economical Results from Smoke Abatement, and Recommendations. As it is one of the most comprehensive reports ever made on this subject, and as it represents the investigation of the subject along scientific lines, we here reprint portions of it.

Regarding the ordinances passed in various cities concerning smoke, the report states:

Of one thing we are quite certain, namely, that the mere passing of an ordinance, no matter how drastic, will not remedy the evil. The enforcement of the ordinances must be rendered unnecessary by the hearty cooperation of steam users. * * * Manufacturers may well argue that a city does not make the industries, but that industries make a city, and, if this be their attitude, the rigid enforcement of the smoke ordinances is improbable in the extreme. * * * When, however, it can be demonstrated that economies may be effected by improved methods of firing, the enforcement of the ordinances becomes a voluntary act of enlightened self-interest on the part of manufacturers.

The report also quotes from a report of the Cleveland Chamber of Commerce upon the same subject, in which it is shown that the residents of that city suffer an annual loss of millions of dollars, due to the injury by smoke of household goods, pictures, books, shopkeepers' stocks, buildings, etc.

A circular letter addressed to 100 manufacturers, hotels, merchants and business firms of all descriptions in Rochester, Cleveland, Detroit, Chicago and Milwaukee, regarding smoke preventing devices, brought about half that number of satisfactory replies, as follows: The plants covered installations of about from one to 34 boilers; 12 stated that they were normally operating above rated capacity. When asked to what extent they considered that they had lessened smoke, 46 out of 52 stated 75 per cent, or more; six stated between 50 and 75 per cent. A saving in labor was reported by 25 and no saving by 23, the latter including, for the most part, small plants. As regards repairs, 19 reported a saving and 24 reported no saving. A few reported repairs increased. A saving in fuel was reported by 29; no saving by 14; none reported increased coal consumption. It was stated by 20 that cheaper coal could be used, while 16 had made no change in their fuel. As regards the gross cost of steam since installing preventing devices, 20 reported a decrease, 10 reported no saving, while 11 were doubtful. The two questions which gave the most valued information were: "Do you consider that in making this installation of a smoke preventing device, you have made a sacrifice to public sentiment?" and, "Do you consider that the good accomplished in smoke abatement is worth the cost to manufacturers, hotels, etc.?" To the first question, 32 replied "no," and of the 10 who said "yes," only five were using mechanical stokers. To the second, 32 said "yes," two said "no," and six were in doubt. This was considered very strong evidence that the manufacturers themselves do not consider that they have been oppressed.

In regard to the causes of smoke, the committee says:

"The direct cause of smoke is that the gases distilled from the coal are not completely burned in the furnace before coming in contact with the surface of the boiler, which chills them below the temperature of ignition. * * * In boiler firing, the formation of smoke must be prevented, as the conditions do not permit of its being burned. The essential conditions for preventing smoke in boiler fires may be enumerated as follows: 1. The gases must be distilled from the coal at a uniform rate. 2. The gases, when distilled, must be brought into intimate mixture with sufficient hot air to burn them completely. 3. The mixing should be done in a fire-brick chamber. 4. The gases should not be allowed to touch the comparatively cold surfaces of the boiler until they are completely burned. This means that the gases shall have sufficient space and time in which to burn before they are allowed to come in contact with the boiler surface. Every one of these four conditions is violated in the ordinary method of burning coal under a steam boiler. * * * In order to obtain the conditions for preventing smoke, it is necessary: 1. That the coal be delivered into the furnaces in small quantities at a time. 2. That the draft be sufficient to carry enough air into the furnace to burn the gases as fast as they are distilled. 3. That the air itself be thoroughly heated, either by passing through a bed of white-hot coke, or by passing through channels in hot brickwork, or by contact with hot firebrick surfaces. 4. That the gas and the air be brought into the most complete and intimate mixture, so that each particle of carbon in the gas meets, before it escapes from the furnace, its necessary supply of air. 5. That the flame produced by the burning shall be completely extinguished by the burning of every particle of the carbon into invisible carbon dioxide. * * * It is impossible with coal containing over 34 per cent of volatile matter and with a water-tube boiler with tubes set close to the grate and vertical gas passages, to prevent smoke even by the most skillful firing. This style of setting for a water-tube boiler should be absolutely condemned. A Dutch oven setting, or a longitudinal setting with firebrick baffle walls, is highly recommended as a smoke preventing furnace, but with such a furnace it is necessary to use considerable skill in firing. * * * Down-draft furnaces and mechanical stokers, of many different kinds are successfully used for smoke prevention, and when properly designed and handled skillfully and usually at a rate not beyond that for which they are designed, prevent all smoke. If these appliances are found giving smoke, it is always due either to over-driving or to unskillful handling. It is necessary, however, that the design of these stokers be suited to the quality of the coal and the quantity be turned, and great care should be taken to provide sufficient size of furnace with a firebrick roof and means of introducing air to make it completely successful."

In discussing the remedy for smoky chimneys, the report takes up four headings: "Proper Hand - Firing," "Steam Jets," "The Hawley Down-Draft Furnace," and "Mechanical Stokers." Great stress is laid on the ef-

fect of proper hand-firing as a preventitive of smoky chimneys. The report quotes from an English author, who says:

It can be laid down as an axiom that good stoking is the main factor in the prevention of smoke from furnaces. In fact, it may be broadly asserted that an intelligent and well-trained stoker (fireman) will often obtain better results from indifferent coal than will a less expert man from superior coal.

The report cites the example of the Prussian government, which makes an annual appropriation for the purpose of instructing firemen, and recommends that such a course be followed in this country. In Prussia it is only when all methods of careful management and supervision of firemen, together with the selection of fuel, have failed to abate smoke, that the authorities recommend the introduction of special appliances. The report gives a copy of the rules which the St. Louis smoke abatement department causes to be posted in every boiler-room and headed "Directions for Firing," as follows:

1. Fire frequently in small quantities and at regular intervals.
2. Break up lumps to fist size.
3. Carry a level surface over the entire grate.
4. Avoid thin and bare spots on the grate.
5. Keep the fires clean.
6. Fire one door at a time, and wait until that fire is in good shape before charging the other door.
7. Leave the furnace door slightly ajar for one minute after firing.

As an example of the economy effected by proper firing, the report of the society in Hamburg, Germany, for smoke abatement is presented, which contains the following figures on efficiency:

	Per cent.
Thermal efficiency, with the regular but untrained firemen.....	66.6
Thermal efficiency of the same plant, with trained firemen....	72.7

In the plant where these tests were made, this loss of 6.1 per cent in the fuel efficiency represented a loss of $8.50 per day, or $50 per week of 144 hours. In another test, the loss, due to untrained stokers, rose to 16.1 per cent, the thermal efficiency being increased from 66.8 per cent to 82.9 per cent by the mere change of the firemen running the plant.

The report further quotes from the Hamburg report, as follows:

Manufacturers and fuel-users generally, in this country, must be taught that the emission of black smoke is largely preventable, and that the smokeless combustion of fuel promotes economy when carried out under proper supervision.

The subject of steam jets is considered briefly, it being stated that many devices for smoke prevention based on the use of the steam jets are of little value and seem to be made only to sell. Others are carefully worked out in their details and are really of use, especially when properly applied to meet the special conditions, and when combined with a device for automatically adjusting the supply of air to the volume of gases produced.

Concerning the down-draft furnace, the report states that it is effective in the reduction of smoke when properly handled, and it is not difficult to secure very satisfactory results, so far as smoke prevention is concerned. The complete combustion is favorable to good economy of fuel and the possibility of high temperature of the products of combustion may result in a very considerable increase in the effective capacity of the boiler. This furnace is considered to be well adapted to single boilers, or to plants too small to warrant the installation of automatic stokers. It may be expected to effectively reduce the smoke emitted from the stack under reasonably favorable conditions, and to do it economically. It requires a good draft for the best results, and is not so well adapted as certain forms of automatic stokers to plants, which must be forced at times greatly in excess of normal capacity.

In discussing mechanical stokers, the report says that from the point of view of smoke prevention, it is merely a means for feeding the coal uniformly into the fire, and, thereby, maintaining uniform conditions, and, therefore, uniform production of hydrocarbon gases, which make it easier to maintain perfect combustion, and hence prevent smoke. In order to prevent smoke, it is quite as necessary to maintain the proper conditions for good combustion with good stokers as without them. To insure these conditions, it is customary to build a firebrick arch over the stoker, either in the shape of a "Dutch oven" in front of the boiler setting, which is a better plan where room permits, or the arch is thrown across the fire-box between the fire and the boiler. It is usually quite difficult to maintain an arch in this position, owing to the high temperature to which the brick work is subjected on both sides, and many devices have been put forward to maintain these arches. The "Dutch" oven construction has the advantage that this arch is free to radiate its heat through the top, and it is, therefore, relatively easy to maintain.

That all devices installed for smoke prevention must be carefully handled is the unanimous report of the smoke inspectors in all the various cities. Mr. Harris, of Toronto, lays great stress upon this point, saying:

I do not mean to convey the idea, however, that there was a complete abatement of the smoke nuisance in all the plants where the mechanical stokers were installed, because, while this style of stoker seems to be the only practical plan available at present, in very many cases it is only the foundation for good work, the next thing being to get them properly operated. So many of the men employed to do the stoking have no idea of the principles of combustion, and it is a very difficult matter to make them handle the stokers as they should. Many owners of plants are also much to blame; they seem to think that, once a mechanical stoker or other device is installed, it should take care of itself, no matter how much neglected or abused.

That economy results from smoke abatement, there is not the least doubt. If a plant is large enough to warrant the installation of mechanical stokers and coal handling equipment, the owner can greatly reduce the quantity of smoke emitted, and, at the same time, effect a considerable saving over hand-firing. A fair return on the investment for the mechanical stokers can be reasonably expected with such a plant.

The cost of installation of any of the smoke preventing appliances is, of course, more of a burden in case of an existing plant than in the erection of a new one. Any method of reducing smoke through obtaining better combustion promises economy of fuel, whether due to special appliances, or more skilful firing.

In recommendations as to the purchase of smoke preventing appliances, the report says that the purchaser should put the burden of responsibility upon the firm installing the device, and that the plans for new steam plants should be submitted to some competent authority for approval. Such an expert should not be connected with the selling interest of any stoker manufacturer, should be free from hobbies, and should have no commercial affiliations apt to influence his judgment. It also recommends co-operation, saying: "Success in smoke prevention can only be attained through the hearty co-operation of the coal users themselves, and for reasons given in previous sections of this report, this co-operation on the part of the owner of every steam plant is earnestly requested." The owner should insist upon the apparatus receiving proper attention and upon the carrying out of the principles and conditions necessary for success.

FLOOR CHARGING AND DRAWING MACHINES—TURRET TYPE.

The accompanying illustrations show a new floor-type furnace charging and drawing machine built by the Alliance Machine Co., Alliance, O. Fig. 1 shows the machine in the act of charging a beam blank into the reheating furnaces, and Fig. 2 shows the machine picking up a beam blank from the floor.

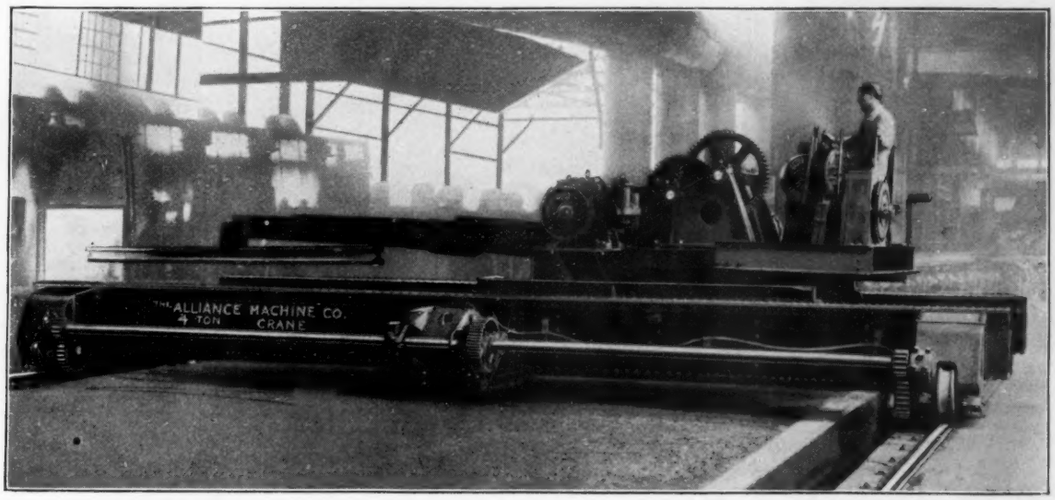


FIG. 1—ELECTRIC FLOOR-TYPE CHARGI NG MACHINE DRAWING BEAM BLANK.

In the mill where this particular machine is installed the reheating furnaces are located between the roughing mill and finishing mill on a longitudinal center line. Furnaces have been completed on one side only as shown, but another line of furnaces will be built on the opposite side so that the machine will run between two lines of furnaces and serve them all.

Ordinarily the hot beam blanks are received from the roughing mill and at once charged in the reheating furnace, but to provide for charging cold blooms or blanks, which may be piled up on the floor at the end of the roughing tables, the machine is so designed that a bloom or beam blank can be picked up from any point on the floor.

The machine is extraordinarily active, as is necessary in this class of work; and to permit the operator to run all motions at the highest speed and then stop the motions very quickly, careful attention was given to the design so as to produce a machine that would safely withstand the shocks and jars incident to such operation.

The girders and end carriages are of structural steel, box construction and framed together so as to render any twisting or racking of the bridge impossible. Both girders and end carriages are designed with a factor of safety far in excess of the usual crane construction both in the net section of material and size and spacing of the riveting. The trolley frame is a combination of structural steel and steel castings. No iron castings whatever are used in machines of this character. The trolley runs on rails located on the main girders with guard rails at the top. The current is carried to the machine through the center of the trolley and thence to the controllers located at the back of the revolving boom.

The boom is arranged with a tilting motion, but the operator's platform is stationary in this respect. The tongs are of the double grip type and have a range wide enough for the average variations in sizes of work to be handled.

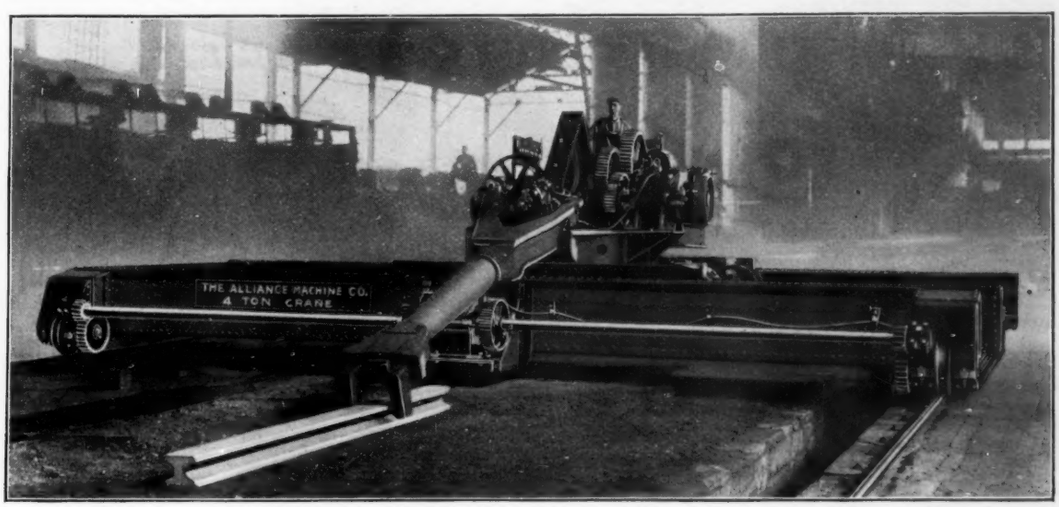


FIG. 2—ELECTRIC FLOOR-TYPE CHARGING MACHINE PICKING BEAM BLANK FROM FLOOR.

The following motions are provided, all of which are controlled by independent reversible motors: Bridge travel, trolley travel, boom revolving, lifting and lowering, gripping and releasing.

DOUBLE RAMMING BY THE BONVILLAIN MOLDING MACHINE

At the regular monthly meeting of the Chicago Foundry Foremen's Association held at Lewis Institute on Saturday evening, Nov. 16, E. H. Mumford, of Philadelphia, gave an illustrated talk, explaining the methods of patternmaking devised by Ph. Bonvillain and E. Ronceray and the molding machines adapted to those methods by them. About 175 men attended the meeting. In particular, Mr. Mumford took occasion to call attention to the new type of this French machine known as the B-4 model, of which pictures were shown here for the first time, and also to the double ramming feature of other models of this machine, which advantage has been so little understood heretofore. Not only were lantern slides used, but the actual foundry operations were shown by means of cinematograph views.

The substance of Mr. Mumford's explanation of the two above features is as follows:

The B-4 machine is different from the other types in that the pattern is mounted on a movable table, which can be raised and lowered beneath the stationary stripping plate, so that, instead of raising the mold up from the pattern, the pattern is drawn downward out of the mold. This type of machine is designed for use particularly where large numbers of pieces are to be made from the one pattern. Figs. 1, 2 and 3 show this machine in three stages of the operation: Fig. 1 with the pattern raised up into the stripping plate and ready for the placing of the flasks for filling in the sand; Fig. 2 indicates the pattern enclosed in the flasks with the sand filler shown on top in white to provide for the reserve amount of sand required to fill in as the ramming progresses. The gate has been set in the pattern in this view and the hydraulic ram is in position to begin compression; Fig. 3 shows the table on which the pattern is mounted lowered out of the flask and at its bottom position, which is the stage at the completion of the mold. Corresponding to these three views are the sketches in Figs. 4, 5 and 6, which explain the steps in the operation of the machine. The ramming of the sand is accompanied by a partial withdrawing of the pattern with the resu't that it is moving in the same direction as the sand during compression, which fact adds greatly to the uniform ramming of the mold and is one of the advantages made possible in this style of machine. In order to provide for this withdrawing action on the pattern as the mold is rammed, the pattern must be mounted on a plaster of Paris base, conformable in outline to the stripping plate and of a height at least as great as the distance through which the pattern is lowered or in other words as great as the elevation of the bottom of the pattern above the stripping plate when the

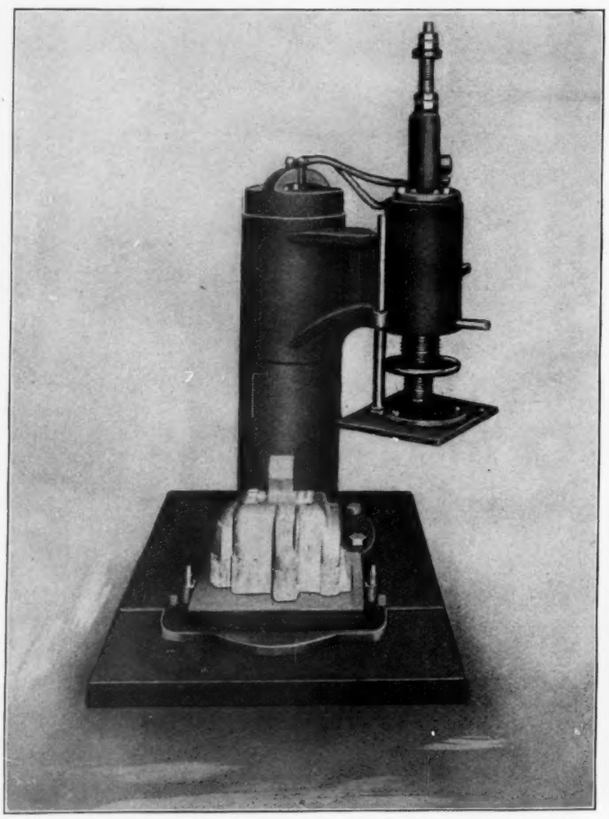


FIG. 1—PATTERN RAISED THROUGH STRIPPING PLATE.

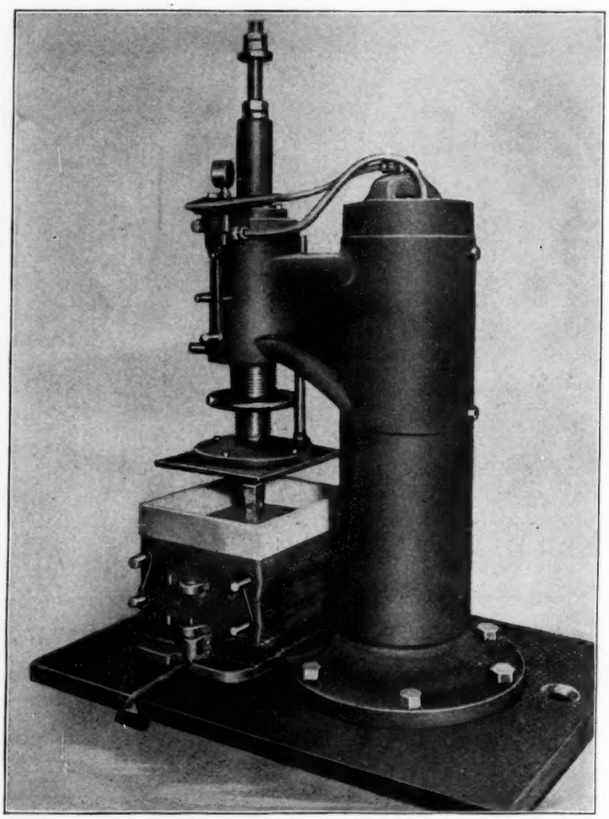


FIG. 2—PATTERN ENCLOSED IN THE FLASK

pattern is at its highest point so that at the end of the partial withdrawing operation, the bottom of the pattern will be flush with the stripping plate. This brings the pattern finally into the normal location with reference to the mold and flasks. With this machine the function of the sand filler is very apparent.

The device for accomplishing this operation consists in having the sprue bear on a spiral spring in the pattern as shown in Figs. 4 and 5, and as the action of the ramming piston compresses the sand in the top of the mold it carries the gate downward also, which downward movement does not shove the pattern down, however, but is taken up in the compression of the spring. How far

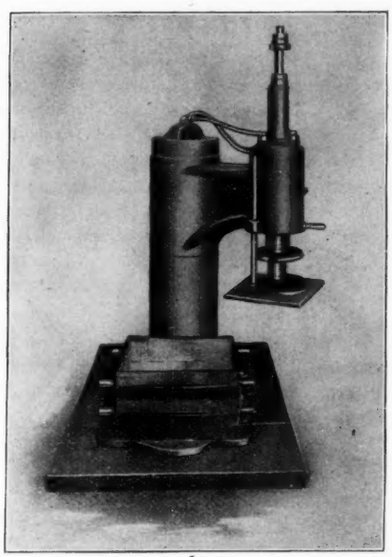


FIG. 3—PATTERN LOWERED OUT OF FLASK

this action should proceed before the pattern should begin to move has been determined by experience and is governed by the extent to which the top layer of sand in the mold should be compressed and accordingly the gate is so shaped and fitted into the pattern as to shoulder up against it when the sand in the top of the mold is rammed to the proper density, and at that instant the pattern begins to move down with the ramming piston. It may be presumed that the top layer of sand acts as a ramming piston on the remainder of the mold and thus reduces the depth of sand to be rammed by that much. The table on which these patterns rest is supported by a piston under pressure which holds the pattern firmly up in the mold and against the ramming piston. The "double ramming" action of the machines other than the B-4 type is a feature provided for those cases where the character of the pattern with reference to its intricacy and cores, make improbable or impossible the

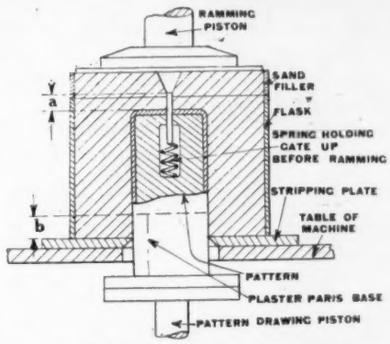


FIG. 4—B-4 MACHINE WHEN STARTING RAMMING

Distance b shows how Pattern is withdrawn while Ramming; Distance a shows the Movement of the Sprue before the Pattern Begins to Move.

perfect ramming of the sand into those particular places, from the downward ramming action alone. It also avoids the necessity for using cores in many instances. Fig. 7 indicates one of the machines provided with this feature, and the method of operating by means of a foot pedal. This foot pedal acts through a cam and screw device on the piston which raises and lowers the table shown in this view and Figs. 8 and 9, beneath the pattern.

The ramming is done by stools dropped through the core holes of the pattern or so placed on the table as to be directly under the portion of the mold to be "double rammed." Around the circumference of the movable table posts are set to regulate the extent of the ramming action and as shown in Fig. 8 the distance the table moves up is determined by the contact of these posts

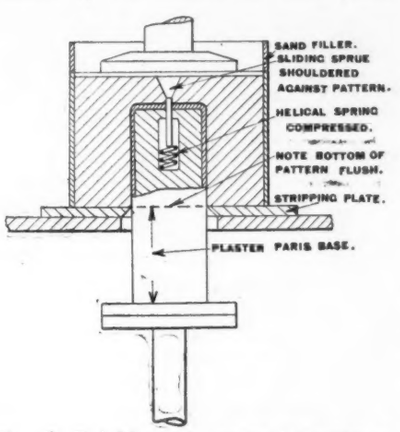


FIG. 5—B-4 MACHINE WHEN RAMMING IS COMPLETED

with the stripping plate. This distance is predetermined and precautions are taken to have it absolutely uniform for all the stools as well. The plaster of Paris base of the pattern is sufficiently thick to serve as a guide for the stools and so when the table is raised these stools are forced up into the mold in the desired places, it ramming the sand to the desired density.

For double ramming in connection with other forms of intricate patterns a thin stripping plate is used. An example of such a pattern is the fan tooth gear shown in Fig. 10. Here the stripping plate, which is made thin enough to permit of its being forced through the sand, is supported by the stools which rest on the movable tables as in the other cases, and takes the place of the sev-

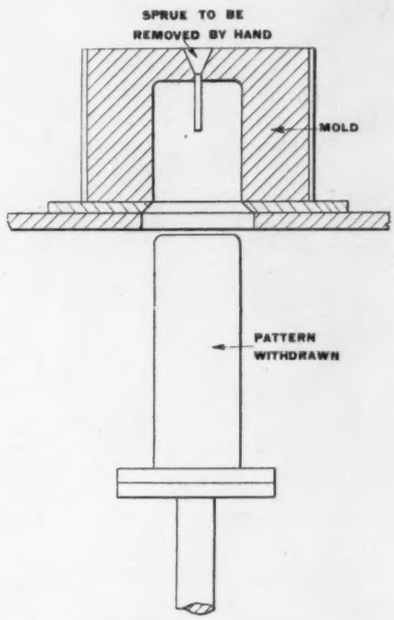


FIG. 6—B-4 MACHINE, SHOWING PATTERN WITHDRAWN.

eral stools. The stripping plate may be made very light because it can be supported in as many places as desired. This device makes possible a very accurate and well rammed formation of the teeth in the mold.

In these types of machines when the mold is completed the pattern remains fixed on the table and the mold is drawn upward and off the pattern by the piston operating the table as shown in Fig. 9. This drawing action begins as soon as the posts come in contact with the stripping plate.

In Fig. 7, it will be noted that the sand filler above the flask is swung from a collar mounted on the pillar of the machine. This arrangement avoids the necessity of raising the ramming piston to clear the sand filler, since the sand filler can be swung on the pillar at the same time as the ramming piston. This feature applies as well to the B-4 machine.

Mr. Mumford's talk also dwelt in general upon the advantages of accuracy and permanency obtainable with the French method of making patterns, and it is understood that plans are being developed for the manufacture of these patterns and molding machines in this country. The B-4 machine is just now being offered for such work as the molding of projectile shells, window counterweights and bathtub forms, where an unlimited duplication of parts obtains.

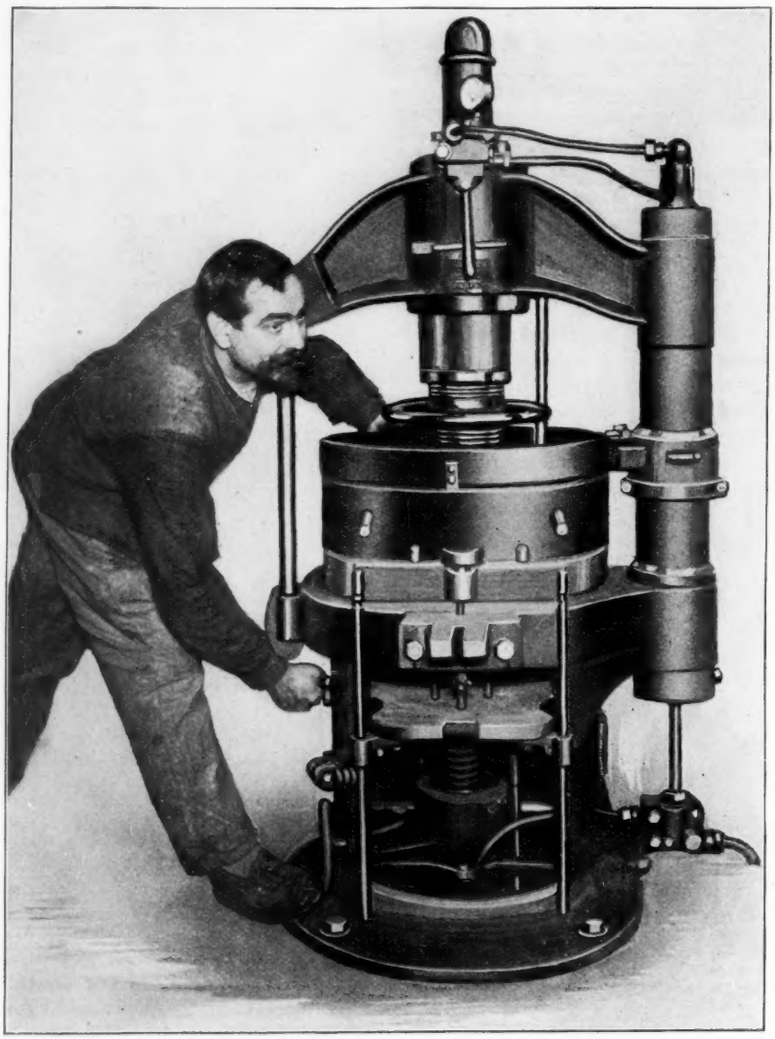


FIG. 7—DOUBLE RAMMING BY MEANS OF A FOOT-PEDAL

The Thomas Iron Co., Hokendauqua, Pa., has put in force a reduction of 10 per cent in the wages of its employes in both mines and works effective Dec. 1. A similar reduction has been announced by the Empire Steel & Iron Co., Catasauqua, Pa.; the Joseph Wharton furnaces, Wharton, N. J.; the Musconetcong Iron Works, Stanhope, N. J., and the Andover Furnace Co., Phillipsburg, N. J.

MANUFACTURE OF FERRO-ALLOYS IN FRANCE.

Consul C. P. H. Nason, of Grenoble, reports on the manufacture of ferro-chrome and ferro-tungsten by a large electro-metallurgical society in France.

The ferro-chrome shows about 65 per cent of chromium. The chromium is extracted from chrome coming from India, New Caledonia, Turkey and Canada, which generally give about 50 per cent of chromium (0.03), the remainder being 35 per cent of oxide of iron and 15 per cent of magnesia, silicon and aluminum. By the addition of different dissolvents, basic or acid, impurities are eliminated and a ferro-chrome is obtained, the purity of which is thoroughly satisfactory for the manufacture of the finest steels.

There exists quite a series of ferro-chromes, and for various purposes, of which the principal are these: Ferro-chrome for iron sheathing and projectiles, showing 65 per cent of chromium, 8 to 10 per cent of carbon, and 2 to 6 per cent of silicon, according to the process of manufacture employed by the different factories. Qualities with 4 to 6 per cent of carbon serve specially for

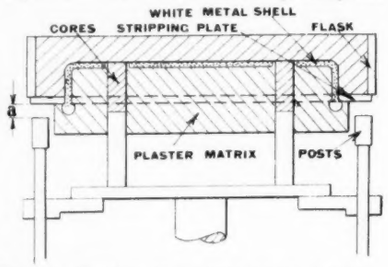


FIG. 8—BEFORE RAMMING FROM UNDERNEATH

Distance "a" = Amount of Double Ramming Judged to be Necessary.

the manufacture of crucible steels, for war material, and the making of steel tools.

Ferro-chromes with a percentage of carbon of from 4 to less than 1 per cent are destined for the manufacture of crucible steel tools. So soft are these ferro-chromes as to be almost all forgeable. The percentage of sulphur and phosphorus in every quality of these ferro-chromes is always less than 0.03 per cent. It may be seen from this analysis that here is a whole series of ferro-chromes which replace very advantageously those produced by blast furnaces.

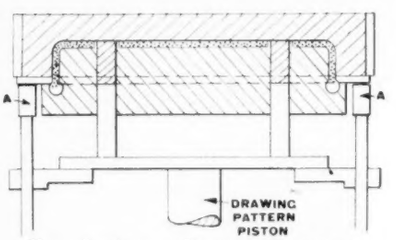


FIG. 9—AFTER DOUBLE RAMMING

Note stools and posts "A" resting against stripping plate.

The society makes a specialty of ferro-tungsten product, the sales of which amount to several million francs per year. Two qualities in particular are made—

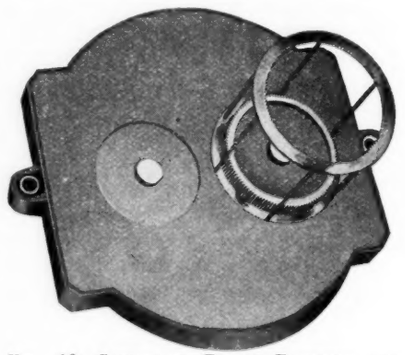


FIG. 10—STRIPPING PLATE PATTERN FOR DOUBLE RAMMING.

the one for crucible steels and the other for water tempering of quick steels, a quality that shows about 85 per cent of

tungsten and a maximum of 0.3 to 0.5 per cent of carbon. It is claimed for this tungsten that it has the great advantage over tungsten in powder form of containing iron already and of not disaffecting the steel crystals, as the powder often does.

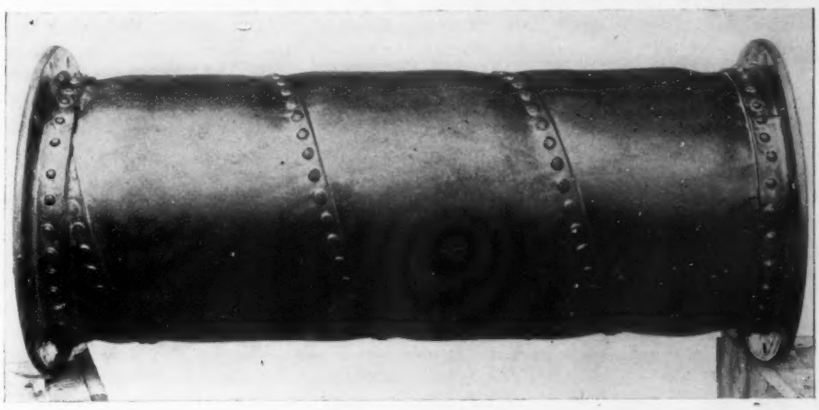
Repeated trials have shown that steels made with ferro-tungsten are not only more economical, but the quality is much more uniform than those made with tungsten powder. Economy is realized through the methods of production, the details of which cannot well be given here, and by reason of the purchase price of ferro-tungsten, which is generally from 5 to 8 per cent less than that of tungsten in the powder. Naturally the quality of the ferro-tungsten itself necessary to produce the results obtained by the new processes must be considered, but these results have always followed with the alloys referred to when employed under proper technical conditions.

Not only has this society produced a ferro-tungsten for crucible steel, but incidentally while developing the manufacture of pure steels for springs and other purposes it has created a quality showing 60 to 70 per cent of tungsten, which has the advantage of dissolving more rapidly and of oxidizing less owing to a greater percentage of carbon, varying from 2 to 3 per cent. This ferro-tungsten is employed to greater advantage than the powder because by heating it beforehand in a open-hearth furnace, a Bessemer converter, or in another form of this converter (Robert or Tropenas) the ferro-tungsten on account of its great specific weight traverses immediately the scoria in fusion and is dissolved without loss in the steel. It can thus be introduced at any moment, and especially at the moment when the processes of the oxidation of the carbon in the steel are finished. This ferro-tungsten is sold, as is always the case, on the basis of pure tungsten, the iron being counted zero. The selling price is about 20 per cent less than that of tungsten powder.

Plans for Sales.—In connection with the purchase of the Tennessee Coal, Iron & Railroad Co., by the United States Steel Corporation, announcement has been made that beginning Dec. 15, all products of the southern company, with the exception of coal, will be handled by the sales agencies which now handle the products of the Carnegie Steel Co., and the Illinois Steel Co. Reports on such products as the Tennessee company makes are to be made to Frank A. Burr, general manager of sales, at Birmingham.

AN INTERESTING TEST OF SPIRAL RIVETED PIPE.

The American Spiral Pipe Co., Chicago, has been performing a series of tests to determine the bursting strength of the spiral pipe which it has designed and manufactures and the accompanying photograph of one of the sections tested illustrates a striking contradiction of the well-worn axiom that the joint is weaker than the sound metal. The illustration is a view of a length of 12-inch spiral riveted pipe, No. 16 gage. The pipe was subjected to a hydraulic pressure of 650 pounds per square inch, which in this case was equivalent to a strain on the steel of 62,531 pounds per square inch, or more than the theoretical pressure required to burst a seamless tube of the same diameter and thickness and made of steel with a tensile strength of 60,000 pounds.



SPIRAL RIVETED PIPE AFTER SUBJECTION TO HIGH HYDRAULIC PRESSURE

The actual inside diameter before testing was 12.10 inches and the actual thickness of the plate 0.063 inches. At the end of the test as indicated the portion of the pipe between the seams had increased over three-fourths of an inch in diameter, while the diameter at the seams had remained practically constant. It was alos found where the test had been carried to the bursting point the rupture invariably occurred between the seams, demonstrating the great strength that has been obtained in this seam.

This pipe is somewhat heavier than other pipe of the same thickness, owing to the wide lap of the seams. It is especially adapted for water supply and steam lines, hydraulic mining and irrigation.

The Newberry charcoal furnace of the Lake Superior Iron & Chemical Co., at Newberry, Mich., has gone out of blast indefinitely.

BOOK REVIEWS

"Modern American Lathe Practice," by Oscar E. Perrigo. New York. The Norman W. Henley Publishing Co. 6¼ x 9½ inches. 424 pages. Illustrated. Cloth. Supplied by THE IRON TRADE REVIEW for $2.50.

This book, comprising 22 chapters, is a comprehensive review of the subject of lathe work as practiced at the present time. The author devotes two chapters to historical matter, tracing the development of the lathe from the old tree lathe, the oldest and crudest form of the machine, through its various stages up to the Freedland lathe of 1853, at which point the lathe presents fairly modern characteristics. An entire chapter is devoted to the classification of lathes, and showing the differences between the various types of engine, speed, turret, gap, forming, pulley and precision lathes, screw machines, multiple spindle lathes, etc. The next five chapters take up the subject of lathe design, the various chapters being devoted respectively to the bed and its supports; the headstock casting, the spindle and spindle cone; the spindle bearings, the back gears and the triple gear mechanism; the tailstock, the carriage and apron; turning rests, supporting rests, shaft straighteners, etc. Various details entering into the construction of all these parts are accurately described and illustrated, the examples being drawn from the practice of the leading manufacturers.

Chapter IX is devoted to lathe attachments, and describes and discusses the use of attachments for machining concave and convex surfaces, backing-off or relieving attachments for cutters, cross-feed stops, grinding attachments and thread-cutting attachments. An entire chapter is devoted to rapid change gear mechanisms, while lathe tools, high-

speed steel, speeds and feeds, and power required for cutting are the subjects of another chapter. This chapter takes up the behavior of metals when being machined, presents the proper shape and sizes of tools for various operations, gives directions for grinding, tempering and hardening and devotes considerable attention to the subject of lubrication. The methods of testing a lathe and various parts of it are presented in chapter XII; the use of hand tools is discussed in chapters XIII and XIV; and the subject of lathe work is discussed in the two following chapters. The carrying out of various operations, the method of setting the work and tools is gone into in considerable detail. The remaining chapters of the book are devoted to descriptive material of engine and special lathes, the machines built by different makers being described in considerable detail. Two entire chapters are devoted to turret lathes, one to the regular machine, the other to special machines. The last chapter of the book is entitled "Electrically-Driven Lathes," and takes up the various systems of electric drive and discusses the principal advantages of driving lathes electrically. There is also some material presented on the subject of the group drive versus the individual motor system. Illustrations are drawn from the practice of a number of lathe builders. The book is a comprehensive treatise on the subject of lathe practice which should prove valuable to all interested in the subject.

"Machine Shop Work," by Frederick W. Turner, instructor in machine shop work, Mechanic Arts High School, Boston. Chicago. American School of Correspondence. 190 pages. Illustrated. 6¾ x 9¾ inches. Cloth. Supplied by THE IRON TRADE REVIEW for $1.50.

A more appropriate title for this work would be "Machine Shop Tools," inasmuch as it comprises principally a description of the various tools used in the machine shop, comparatively little space being given to machine shop practice. The book is divided into four parts entitled, respectively, "Tools Operated by Hand"; "Lathe"; "The Drill Press and Planing Machine"; and "Milling and Grinding Machines."

The first part, devoted to hand tools, gives detailed descriptions of all forms of gages, measuring instruments, files, hammers, drills, taps, dies, reamers, etc. Directions for the proper use of each of these instruments are given. Part II, devoted to the lathe, describes briefly the speed and engine lathes and gives directions for performing the simpler operations, such as centering, taper turning, etc., eccentric turning and screw cutting. Included in this latter subject, is the method of calculating change gears. In a book of this size it is hardly to be expected that any extended description of the more complicated operations which can be done in a lathe could be given. Merely enough information concerning the machine and its parts is presented to enable the reader to familiarize himself with the functions of these parts. The drill press is described and the method of operating the various types is presented briefly. Five pages are devoted to the planer and an equal number to shaper work. The milling machine is covered in 34 pages, profusely illustrated, showing the various forms of cutters and mills which are used. Very little space is given to the actual operating of the machine and much is left to inference. The grinding machine is covered in six pages and the remainder of the book is devoted to the subject of laying out work and shop suggestions. A valuable feature of the work is the questions appended to each chapter, which are so designed as to require the actual working out of problems from information obtained by reading the various chapters.

"A Manual of Fire Assaying," by Charles H. Fulton, president and professor of metallurgy in the South Dakota School of Mines. New York. The Hill Publishing Co. 6⅜ x 9⅜ inches. 178 pages. Illustrated. Supplied by THE IRON TRADE REVIEW for $2.00.

The author of this work, in the preface, states that he has long recognized the need of a work on fire assaying that treats the subject from the scientific and rational point of view rather than that from the "rule of thumb." This last, he states, covers most modern works on the subject. The book is closely confined to the subject of fire assaying, which it treats in detail. It comprises 14 chapters, the first eight of which contain a description of the various tools and operations necessary, while the remaining chapters give detailed information regarding the assaying of various ores and alloys.

Chapter I, "Assay Furnaces and Tools," presents descriptions and illustrations of the most commonly used furnaces, together with the implements necessary for their manipulation. Chapter II presents definitions used throughout the work, discusses the reagents necessary in assaying and also gives directions for the assaying of reagents, which is essential, in order that the assayer may be assured of the fact that the reagents are pure. Sampling is discussed in chapter II, the various methods used being clearly presented. The author severely criticizes the coning and quartering method of sampling, on account of its necessarily high cost and the great possibilities of inaccuracy which exist unless the work is skillfully conducted. Detailed directions are given as to the preparation of the assay sample and also methods of sampling lead and copper bullion. Weighing and the subject of balances and weights are taken up in chapter IV, while the reactions obtained in assaying are discussed in chapter V. Among these reactions may be mentioned the oxidation of impurities by niter, niter reactions with reducing agents, reactions between metallic lead and niter, niter and carbon, niter and pyrite, the influence of silica on the reactions and the oxidizing power in ores. The crucible assay and assay slags are discussed in chapter VI, the influence of various temperatures on the formation of slags, the mode of occurrence of slags and their classification being presented. A table for the calculation of slags, which should prove valuable, is also included in this chapter. Chapter VII describes the operation of cupellation, and chapter VIII is devoted to parting. The ratio of gold to silver necessary to part with nitric acid, the strength and temperature of the acid, parting devices and annealing are discussed in this chapter. The remaining chapters are all devoted to special assays, their headings being as follows:

"The Assay of Ores Containing Impurities," "Special Methods of Assay," "Errors in the Assay for Gold and Silver," "The Assay of Bullion," "The Assay of Ores and Alloys Containing Platinum, Iridium, Gold, Silver, etc." and "The Assay of Tin, Mercury, Lead, Bismuth and Antimony,"

The book, while extremely scientific in character, presents much information of interest to the ordinary reader and the first few chapters can be read with profit by those who desire a general knowledge of the subject of assaying. The latter chapters are especially complete and should prove of much value to the professional assayer.

To Remodel Furnace.—The Quinn blast furnace at Gadsden, Ala., has been purchased by St. Louis parties and is to be remodeled and changed into a coke stack. The furnace has heretofore been manufacturing charcoal iron with a capacity of less than 100 tons a day. It is not expected that the furnace will be improved within eight months.

BELFONT IRON WORKS

Added to List of Idle Plants—More Stacks May Go Out of Blast.

(Special Correspondence.)

Ironton, O., Dec. 17.—There is no material improvement in the situation in this district and the indications are for several stacks going out of blast by the first of the year unless there is a demand for iron. While the Kelly Nail & Iron Co. plant resumed recently with prospects for a run of several weeks on present business, the works of the Belfont Iron Works Co. closed down Dec. 7. The Kelly plant has stock for a run until the first of the year and future operations would depend upon the steel plant and rod mill activity at Ashland, Ky., where billets and rods are secured. These plants are still idle, as is also the Portsmouth Steel Co. plant. Regarding the latter, the company has made no official announcement, but it is understood at Portsmouth that conditions may permit of resumption about the first of the year. The machine shops at the plant has resumed, the foundry department getting out an order for several carloads of ingot molds for a New York concern. W. L. Glessner, of Wheeling, president of the company, was at Portsmouth recently on one of his regular visits of inspection, but made no statement as to the future plans of the company. A number of the salaried men have been laid off.

The Ohio Fire Brick Preserving Co. of Wellston, has secured its first large contract. The company will reline and put an inwall in Olive Furnace, operated at Olive Furnace, this county, by the McGugin Iron & Coal Co. The work will be done within the next six weeks. The Ohio Malleable Iron Works at Columbus is also making a test of the new brick in one of its furnaces.

While in Portsmouth last week, President Glessner of the Portsmouth Steel Co. urged the prosecution of the work on the new mill being installed for the Otis-Spencer Co. of Chicago, so that it can be ready for operation soon after the steel plant resumes. Lathes, planers, shapers, drill presses and other machinery to the value of $15,000 will be installed. Jos. Sholes of Laramie, Wyo., is superintending the work, and J. F. Butler of Lorain will have charge of the machines.

William E. Hancock, now connected with the water works department at Portsmouth, expects soon to open a machine shop in Portsmouth, in association with his two sons.

Chief Clerk C. H. Haines of the Portsmouth Steel Co. recently resigned with the suspension of the plant and accepted a position with the Buckeye Brick Co. at Scioto Furnace, O.

Robert Clare of the Ohio Stove Co. at Portsmouth, states that the company has orders to keep the plant operating until the first of the year. The Portsmouth Stove & Range Works and the Foster Stove Co. of this city are still operating, local foundrymen seeming not to have felt the effects of the depression.

An order was issued at the M. & W. shops at Portsmouth recently, cutting down the time of machinists and all shop men from ten to nine hours. The blacksmiths and boilermakers are also affected.

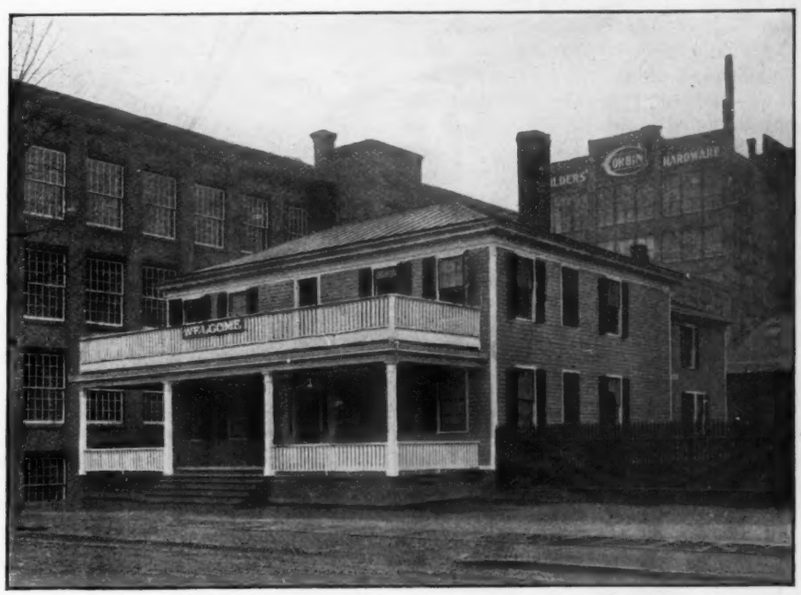
The Pittsburg Portable Radiator Co., Pittsburg, recently incorporated, is carrying on a large mail order business in its portable hot water radiators, and has already established agencies in the main cities of the country, including Chicago, Cleveland, St. Louis, Pittsburg, Philadelphia, Buffalo, Boston, etc. The radiator of the company is made of pressed sheet steel and heated by a gas burner. The company has a capitalization of $100,000 and the officers are John C. Humbird, president; J. Smith Humbird Jr., secretary, and G. Torrence Miller, treasurer.

The Phoenix Iron Co., Philadelphia, in its statement to the Massachusetts state commissioners of its financial condition as of Oct. 12, 1907, shows total assets of $6,894,954.

CLUB HOUSE

Provided For Foremen by the Corbin Companies.

A notable step along the line of social betterment of employes reached a realization in the opening, with appropriate ceremonies, Nov. 20, of a club house for the foremen of B. & F. Corbin and the Corbin Cabinet Lock Co., at New Britain, Conn. At that time Philip Corbin, of the Corbin companies, in a short speech expressing the good will of the employers toward their men, formally presented the keys of the club house to the foremen. Presidents Alonzo J. Hart and Francis Davis, of the respective foremen's organizations, responded in behalf of their members and feelingly thanked the officers of the companies for their generosity toward the men. The remainder of the evening was given over to general good fellowship directed by Vice President C. H. Parsons as master of ceremonies.



CLUB HOUSE PROVIDED FOR CORBIN COMPANIES' FOREMEN.

The new club house, which is ideally located in respect to the Corbin plants, was recently purchased by the company primarily to afford needed space for plant extension. However, the possibilities for the use, in another way, of the mansion, which had been the residence of the late Deacon Peck, a former official of the P. & F. Corbin Co., were recognized by the employers and plans were immediately prepared and executed for the remodeling of the structure into a modern club house, and its presentation to the foremen followed. The new club is arranged in reception rooms, meeting rooms, game rooms, etc., all designed for the pleasure and convenience of the foremen's organizations. The honorary membership of the two clubs includes the leading officers and directors of the Corbin companies.

HOPEFUL VIEW

Of Conditions for New Year Held by Columbus Manufacturers.

(Special Correspondence.)

Columbus, O., Dec. 17.—There has been little change in the industrial conditions in Columbus during the last week, but managers are still hoping for a decided turn for the better after the first of the year. The most encouraging report of the week comes from the Columbus Iron & Steel Co. A representative of this company said it had been operating both its furnaces with a full force of men and full time, throughout the business depression. The company had a large number of orders ahead which has kept it busy. It has not had many inquiries looking to future business, however, until within the last few days, when more inquiries have arrived than in the previous 30 days.

The Kilbourne-Jacobs Mfg. Co. says their export business is holding up nicely and they are beginning to receive inquiries looking to future domestic orders.

David Singleton, of the Columbus Forge & Iron Co., says there is no change in the situation but the conditions still indicate a good business after the holidays. The Buckeye Steel Castings Co. is continuing to reduce its force. It is employing only about 50 per cent of its normal force now.

The Bonny-Floyd Castings Co. and the Columbus Malleable Casting Co., two companies that have started operation within the last six months, say they are receiving few inquiries, but they have reason to believe that business will revive within the next few months.

Pig iron, fire clay and brick are eliminated from the seventh class of freight which the Ohio Shippers' Association asks the Ohio railroad commission to establish. The association has filed an amended petition with the commission in which it gives as a reason for leaving these commodities out that nine-tenths of this business is already cared for by special commodity rates and that the other tenth can arrange for these rates if it so chooses. The amended petition also eliminates all reference to a distance tariff.

The Capital Lock-Nut & Washer Co., of Columbus, has completed a large order for bolts and nuts to be used on 3,000 dump cars that are to go into service on the Panama canal work. The cars are being built by the Oliver Car Works of Knoxville, Tenn.

The Quad Stove Mfg. Co., Columbus, O., which recently moved into its new factory, will close this year with an approximate increase of 20 per cent in its business, over the previous year. The company manufactures army ranges and has a practical monopoly of that business.

Officials of the Hocking Valley railway hope to have the new freight car repair shops, which are now being erected at Logan, O., in operation early in the new year. All of the seven buildings which comprise the shops are now under roof and the work of completing them and installing the machinery is progressing rapidly. The latest type of machinery, to be operated by independent motors, is being installed. When these shops are completed, it will not be necessary for the company to send any of its repair work to outside shops.

AMONG THE INDUSTRIES OF INDIANA.

(Special Correspondence.)

Indianapolis, Ind., Dec. 16.—The foundry of the M. H. Goldstein Co. was almost totally destroyed by fire Dec. 11. Insurance was carried on the plant and it will probably be rebuilt immediately. The loss was estimated at from $10,000 to $12,000.

Harvey Laughlin, of Linton, has purchased $25,000 of stock in the Linton Rolling Mill, which was formerly held by stockholders living in Terre Haute.

The American Insulating Material Mfg. Co. is having plans made for the construction of a large addition to its plant at Alexandria and will probably need some new equipment.

After a shut-down of several weeks, the plant of the Ames Shovel & Tool Co., at Elwood, has been reopened. About 200 men are employed, the payroll averaging $10,000 a week.

As soon as the insurance can be adjusted, the plant of the Rockford Piano Co., at Tipton, destroyed by fire a few days ago at a loss of $45,000, will be rebuilt.

W. R. Hicks, of Elwood, has been given the contract for building the car barns for the Indiana Union Traction Co. at Tipton. The contract amounts to about $90,000 and the new building will be of modern construction.

There seems to be marked improvement in the financial situation so far as it affects manufacturers. Word comes from Columbus that Reeves & Co. and the Caldwell Mfg. Co. have both reopened their plants with full forces in that city. There is not much improvement in Indianapolis.

LITTLE CHANGE

Shown in New England Conditions—Some Cancellations.

(Special Correspondence.)

Worcester, Mass., Dec. 16.—In general, the situation does not seem to be getting any worse. In particular instances the outlook is more gloomy, while in other cases a better tone is evident. One important manufacturing corporation, making machinery, has closed down completely, for a few weeks. Inability to get money is the principal reason. Another Worcester manufacturing concern is working eight hours per day, five days per week. It reports numerous cancellations and a falling foreign business, especially in Germany. This shop can see no brightness in the near future, and is much downcast because of numerous countermands of orders. It is understood, however, that some of these orders were for stock.

The large alundum wheel makers report working 40 hours per week and while business is quiet now they say it generally is during December. They report a better tone to inquiries the past week, and look for further improvement after the first of the year. The Bradley Car Works is working full force, and putting in evening time, with new car orders ahead.

The two plants of the American Steel & Wire Co. are running 10 hours per day, six days per week, with but little reduction of help, excepting in some of the night shifts. The South Works usually shuts down in December at its open-hearth steel furnaces for repairs. Last year it was too busy to shut down, but has done so this year, meantime getting its steel from the west. Collections are all made from its New York office, so no report can be made as to collections.

A large lathe making shop reports better inquiries, although no new orders are coming in. No new orders come from Europe, but on the other hand no cancellations either. It looks for a gradual improvement soon.

Such concerns as are financially able are discounting their bills as usual, while others are obliged temporarily to forego this very helpful method of making profit. While the banks are taking care of their regular customers at fair interest rates for loans, much better rates are demanded of others. People who withdrew deposits from the savings banks a short time ago, are returning the money.

GOOD BUSINESS

Expected to Come in Canada with the Advent of the New Year.

(Special Correspondence.)

Toronto, Canada, Dec. 15.—Iron and steel manufacturers regard the prospect for the resumption of activity and a busy season next year as decidedly encouraging. This view is based on the necessarily heavy demands for railroad construction and equipment, as the building of the Grand Trunk Pacific will require a steady supply of steel rails and other material, and all the leading railways must considerably increase their rolling stock. In other lines the western demand, continually increasing with the progress of settlement, is a certain factor assuring a growing market for agricultural implements, wire fencing, building, hardware, etc. The activity in the Cobalt mining industry continues, despite the depression in the stock market, with 2,000 men steadily at work. Latterly a large percentage of the machinery required has been produced in Toronto, and with the opening of new mines this is becoming a prominent feature of the trade. Taking all these considerations into account there is every reason to anticipate good business for some time.

So far as the general prosperity is concerned a hopeful indication is the early setting in of the Christmas buying season and the expenditure of a large amount of money in the stores. The financial stringency appears to have had little effect on the holiday trade. At the same time there is undoubtedly an increasing number, amounting to many thousands, out of employment here, who will have to be cared for either by charity or by having work found for them by the city. Only a very small proportion of this distress, however, is due to the laying off of industrial help, the principal cause being, as previously stated, the ill-advised policy of the government in encouraging and bonusing immigration far in excess of the requirements of the country.

Construction work is being rapidly pushed on the new Grand Trunk railway repair shops at Stratford, Ont., in the hope of getting a portion of the plant under cover before the cold weather sets in. The larger buildings include a machine shop 616 by 175 feet and a boiler shop 154 by 135 feet. The locomotive and construction plant to be installed will be most complete and will include a 120-ton electric crane, capable of carrying the largest locomotive in the service. The new shops will be capable of repairing 28 engines simultaneously and are so built that this capacity can be increased if necessary.

A careful calculation by the railway engineers as to the quantity of steel rails which will be required next year, including orders already placed, puts the total at 380,000 tons, inclusive of the requirements of the Grand Trunk Pacific. It is a foregone conclusion, therefore, that the steel rail mills at Sault Ste. Marie and Sydney, N. S., will be kept busy in supplying the demand.

THE PRODUCTION OF ABRASIVE MATERIALS IN 1906.

The abrasive materials that are included in this report compiled by the United States Geological Survey are as follows: Oilstones and scythestones, grindstones and pulpstones, buhrstones and millstones, pumice, infusorial earth and tripoli, crystalline quartz and feldspar, garnet, corundum and emery, carborundum, crushed steel and artificial corundum. Of these materials, there is, in some cases, but a small part of the entire production that is actually used for abrasive purposes, and in the following, there is included, with the exception of infusorial earth and tripoli, only that portion of the production that is actually used for abrasive purposes.

The features of the year in the production of abrasive materials were in the further decrease in the production of grindstones and pulpstones and the lowest recorded figure for corundum and emery. The latter is offset by the increased quantity of artificial abrasives, the alundum or artificial corundum output being the largest so far recorded, and carborundum being stronger than in 1905. All of the other natural abrasive materials listed showed an increased value in 1906 over 1905.

The total value of the natural abrasive materials produced during 1906 was $1,473,393, as compared with $1,427,980 in 1905, an increase of $45,413. The total value of the artificial abrasives manufactured during 1906 amounted to $777,081, as compared with $701,400 in 1905, an increase of $75,681. In quantity, the total production in 1906 amounted to 11,774,300 pounds, as compared with 9,820,000 pounds in 1905, an increase of 1,954,300 pounds over 1905. The total value of all abrasive materials consumed in the United States in 1906 amounted to $3,160,438.

The production of buhrstones and millstones in the United States during 1906 was valued at $48,590, an increase of $10,616.

The production of corundum and emery in 1906 amounted to 1,160 tons (2,000 pounds), valued at $44,310, as compared with 2,126 tons valued at $61,464 in 1905. The whole production came from Massachusetts and New York, except a small quantity from Kansas. The Canadian production of corundum in 1906 was 2,274 tons, valued at $204,973, as compared with 1,644 tons, valued at $149,153, in 1905, an increase of 630 tons in quantity and $55,820 in value. The production of crystalline quartz and feldspar during 1906 amounted to 24,082 tons, valued at $121,671, as compared with 19,039 tons, valued at $88,118 in 1905, an increase of 5,043 tons in quantity and of $33,553 in value. The production of abrasive garnet in 1906 in the United States amounted to 4,650 tons, valued at $157,000. This falls short of 400 tons in quantity, but exceeds in value by $8,905 the production for 1905, which amounted to 5,050 tons, valued at $148,095. The value of grindstones and pulpstones produced during 1906 amounted to $744,894, as compared with $777,606 in 1905, a decrease of $32,712, the Canadian production of grindstones amounting to $61,624, as compared with $57,200 in 1905. In quantity, there were 5,546 tons produced in 1906 and 5,172 tons in 1905. The amount of infusorial earth produced in 1906 reached 8,099 tons, valued at $72,108, a decrease of 2,878 tons and an increase in value of $7,471 over the output of 1905, which amounted to 10,977 tons, valued at $64,637. The production of oilstones and scythestones in 1906 amounted to $268,070 in value, as compared with $244,546 in 1905. An increase of 10,368 tons in quantity and of $11,210 in value is noted in the 1906 production of pumice, the amount in tons reaching 12,200, valued at $16,750, in 1906, as compared with 1,832 tons, valued at $5,540 in 1905. There were 6,225,300 pounds of carborundum produced in 1906 and 5,596,000 pounds in 1905. The crushed steel production in 1906 amounted to 837,000 pounds, valued at $58,590, in 1906, and 612,000 pounds in 1905, valued at $56,840. The production of alundum in 1906 amounted to 4,712,000 pounds, valued at $282,720, as compared with 3,612,000 pounds, valued at $252,840 in 1906.

The Zanesville & Western has placed an order with the Ralston Steel Car Co., of Columbus, for 500 50-ton drop bottom coal cars. The company is building 500 similar cars for the Hocking Valley.

MANGANESE INDUSTRY

Shows Revival in United States in 1906—Government Report.

The year 1906 witnessed a rather marked revival of the American manganese industry, the output exceeding that of 1905, 1904, and 1903, and closely approaching the production of 1902, says Edwin C. Eckel in the report of the United States Geological Survey upon the production of manganese ore in the United States in 1906. Nothing like the outputs of the period from 1884 to 1901 was, however, made in 1906. The temporary revival of the industry was marked by increased interest in prospecting and opening up new manganese properties and in reopening old mines. It was also, unfortunately, accompanied by the exploitation of many manganese mining companies of doubtful character, the manganese-ore industry being of a nature to lend itself readily to promotions of this type.

The manganese industry of the United States has never been established on a sound basis. Even during the period of greatest production not more than two or three manganese mines were operated in business-like fashion. The bulk of the product has come from small workings, operated irregularly and inefficiently by individuals with little technical ability and less capital. Manganese deposits are, as a rule, very irregular in form, and are likely to show very rapid variations in grade of ore. It is consequently difficult to work them efficiently on a small scale, for in order to be able to ship high-grade ore steadily a good concentrating plant is necessary, and such a plant cannot be built or operated simply to handle the output from one or two small pits.

Manganese Ores.

The ores included under this head are relatively pure manganese ores, carrying 40 per cent or more of metallic manganese. Ores carrying less than this percentage of manganese, with relatively high iron, are reported under the heading of manganiferous iron ore.

During 1906 the production of manganese ores amounted to 6,921 long tons, valued at $88,132, an increase of 2,803 tons, or 68.1 per cent, in quantity, and of $51,918, or 143.4 per cent, in value over the production of 1905, which was 4,118 long tons, valued at $36,214. All of this increase is due to large reported increases in the output of Virginia and Utah, for no other states produced any notable quantity of manganese in 1906. Virginia's production in 1906 was 6,028 long tons, and Utah's 800 long tons.

The relative quantities and values of domestic and imported manganese ores from 1901 to 1906 in long tons are as follows:

Year.	—Domestic production— Quantity.	Value.	—Imports— Quantity.	Value.
1901	11,995	$ 116,722	165,722	$ 1,486,573
1902	7,477	60,911	235,576	1,931,283
1903	2,825	25,335	146,056	1,278,108
1904	3,146	29,466	108,519	901,592
1905	4,118	36,214	257,033	1,952,407
1906	6,921	88,132	221,260	1,696,043
Total for 18 years (1889-1906)	205,824	$1,875,106	2,169,818	$18,856,582

Manganiferous Iron Ores.

In addition to the output of relatively high-grade manganese ores, there is in Arkansas and Colorado a very important production of iron ores carrying 20 to 40 per cent of manganese. These ores have hitherto been reported among the iron ores, though their output was repeated under manganese. As this method of procedure seems likely to cause confusion, the output of highly manganiferous iron ores for 1906 is reported separately as follows:

State	1904.	1905.	1906.
Arkansas	600	3,321	8,900
Colorado	17,071	45,837	32,400
Total	17,674	49,158	41,300

A large proportion of the iron ores of the Lake Superior district carry sufficient manganese to be notable, but as the output of these ores has been included in the iron ore report, it is not reported separately. These Lake Superior ores carry from 1 to 8 per cent manganese, and can not therefore be grouped satisfactorily with either the pure manganese ores or with the highly manganiferous iron ores of Arkansas and Colorado. A fair assumption would be that during 1906 the Lake Superior district produced about 1,000,000 long tons of this very low manganese iron ore, and that its average manganese content was about 4 per cent.

CORPORATION SUCCEEDS PARTNERSHIP.

Thomas W. Pangborn Co., New York, with factory and warehouse in Jersey City, manufacturer, dealer and agent in equipment and supplies for foundries, machine shops and pattern shops, having operated on a copartnership plan for several years, has been organized into a corporation. The same name is retained and the active management will be unchanged.

The corporation begins business Jan. 1 with a capitalization of $60,000, of which $55,000 has already been paid in. The officers are: Thomas W. Pangborn, president and treasurer; Edward R. Cooledge, vice president; and John C. Pangborn, secretary. The directors include the above named officers, together with the following: John P. Beck, president W. R. Ostrander & Co., New York; A. J. Powell, general manager Bradbury Piano Co. and secretary of the Webster Piano Co., Brooklyn, N. Y.; S. E. Martin, of Hoy, Martin & Burnet, attorneys, New York; and Frederick Schumann, retired, Brooklyn, N. Y.

The growth of the business of this concern has been phenomenal. Originally launched along very moderate lines, it has developed to such an extent that a large organization is now required for the handling of its many departments. On the completion of the West street building last May, its offices were removed to that center of the machinery and foundry trade and a handsome suite on the fifteenth floor is now occupied.

Good Cheer Letter.—A number of concerns, which believe in preaching the doctrine of optimism, are sending out letters to salesmen and customers which have the right ring. A very clever production is that of the Ward-Dickey Steel Co., of Indiana Harbor, Ind.—a circular letter entitled, "That Comment Missed Us After All." It is a good cheer letter, showing how fundamental conditions are sound, and declaring that it is time to play "ball" and not "bawl."

San Francisco's Rebuilding.—Covering practically the month of October, the report of San Francisco's condition shows building permits of the value of $2,219,157 issued during that time, and a total of $89,366,520 issued since the fire. Real estate sales numbered 300, of the value of $850,000. The bank clearings were $122,391,524, against $232,238,872 in November, 1906, and $175,162,702 in November, 1905. Customs receipts aggregated $552,510.

Thomas K. Dalzell and Alfred J. Gennell have been appointed receivers of the Temple Ornamental & Structural Iron Works Co., Temple, Pa., a New Jersey corporation, capitalized at $100,000. The receivers were named to prevent a sacrifice of the plant, and they are authorized to continue the business. The stringent state of the financial market is reported to have caused the company's embarrassment.

Reaction Depresses Security Prices

In the reaction of security prices during the past week, following a period of substantial recovery, indications are found that the recent improvement in the stock market has been at a too rapid gait to firmly establish the higher levels. The fall in prices was a logical sequence of the developments of the period. With the rising market, the covering of short interests fell away greatly and call money became dear and scarce. The currency premium did not disappear as fast as was expected and banks called loans of necessity. The average price of both industrial and railroad stocks declined more than 3 points within the week, but the recollection of a net average gain of 9 points in the preceding fortnight tends to illustrate the excessive rebound in so short a period, considering financial conditions, and marks the subsequent decline as a natural outcome. As the big year end settlements draw near, there is a general realization that a sharp stringency in money must be passed through before the new year, with its brighter prospects for resumption of normal conditions, is reached. Preparations for these disbursements have already had an influence in the tighter money market. Call money during the past week went to 25 per cent, the highest level in about six weeks. A year ago, the highest rate for call money at the end of December was 40 per cent, while two years ago it was 125 per cent. A stiffer tone in time money naturally accompanied the rise in call rates, and offerings have been meager. Business has been nominal and most loans reported have been for six months at 8 per cent, with a few for short terms at 12 per cent. The New York associated bank statement becomes increasingly satisfactory with each week. The net reserves were increased $6,109,175, reducing the deficit in the total reserve to $40,101,175, corresponding to a deficit of $1,699,050 a year ago, and a surplus of $3,961,075 two years ago. Total cash holdings were increased $4,112,800. Deposits declined $7,985,500, and against these withdrawals, loans were contracted $11,367,700. Another large addition was made to the bank note circulation, the total of the New York banks now outstanding being about $69,000,000.

Financial Notes.

Recent dividend declarations include the following: Crucible Steel Co. of America, quarterly dividend of 1 per cent on the preferred stock; Empire Steel & Iron Co., regular semi-annual dividend of 3 per cent, payable Jan. 1; American Iron & Steel Mfg. Co., quarterly dividend of 1½ per cent, payable Jan. 1; Railway Equipment Corporation, monthly dividend of 1½ per cent and an extra dividend of 2 per cent, payable Dec. 16; Standard Screw Co., regular semi-annual dividends of 3 per cent on its preferred and common stocks, payable Jan. 1; Otis Elevator Co., regular quarterly dividend of 1½ per cent on its preferred stock, payable Jan. 15; Columbus & Hocking Coal & Iron Co., regular quarterly dividend of 1½ per cent on the preferred stock, payable Jan. 2; Nova Scotia Steel & Coal Co., regular quarterly dividends of 1½ per cent on the common and 2 per cent on the preferred stocks, payable Jan. 15; Sloss-Sheffield Steel & Iron Co., regular dividend of 7 per cent on its preferred stock for the ensuing year, payable quarterly, Jan. 2, April 1, July 1 and Oct. 1; United Shoe Machinery Co., regular quarterly dividends of 1½ per cent on its preferred and 2 per cent on its common stocks, payable Jan. 4; Canadian Westinghouse Co., Ltd., regular quarterly divident of 1½ per cent, payable Jan. 10; Westinghouse Air Brake Co., regular quarterly dividend of 2½ per cent and an extra dividend of 2½ per cent, payable Jan. 31.

THE LEADING INDUSTRIAL SECURITIES.

	Clos'ng Quo Dec. 14	Changes in Week	Date 1908 Ann. M't'g	Stock Outstanding	Dividend		
					Basis	Last Declared	Date Last Div. Pay.
Allis-Chalmers	6	– ⅝	Sept. 6	19,820,000			
Allis-Chalmers pr	16⅝	.....		16,150,000	7 cum	1¾ Q.	Feb., 1904
American Can	3½	– ½	Feb. 1	41,233,300			
Am. Can pr	39½	– ½		41,233,300	7 cum	1¾ Q.	Oct , 1907
Am. Car and Fdy	29⅛	–4	June 28	30,000,000		1 Q.	Oct., 1907
Am. Car and Fdy pr	86	–1⅛		30,000,000	7 n. c.	1¾ Q.	Oct., 1907
American Loc	35⅛	–3⅜	Oct. 16	25,000,000	5	1¼ Q.	Nov..1907
American Loc. pr	88	+1⅛		25,000,000	7 cum	1¾ Q.	Oct.,1907
American Ship	46	+ ¾	Oct. 10	7,600,000	4	3	Sept. 1907
American Ship pr	92⅛	+6⅛		7,900,000	7 n. c.	1¾ Q.	Oct., 1907
Am. Steel Foundries	5⅜	.....	Oct. 2	15,810,000		.....	.....
Am. Steel Foundries pr	28	+1		17,240,000	6 cum	2½	Aug., 1904
Barney & Smith	65	.....	June 5	2,000,000	4	1 Q.	Sept.,1907
Barney & Smith pr	128½	.....		2,500 000	8 cum	2 Q.	Sept.,1907
Bethlehem Steel	9	.....	April 3	14,862,000		.....	.....
Bethlehem Steel pr	23	.....		14,90*,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	27⅝	.....	March 20	45,000,000*	6	1½ S. A.	Aug.,1907
Cambria Iron	42	.....		8,468,000*	4	2 S. A.	Apr.,1907
Chicago Pneumatic Tool	25	.....	Feb. 19	6,145,800	4	1 Q.	Oct., 1907
Colorado Fuel	18½	–2	Oct. 22	34,235,500		3½	Apr..1902
Crucible Steel	6	.....	Oct. 17	24,578,400		.....	.....
Crucible Steel pr	55⅜	.....		24,436,500	7 cum	1¾ Q.	Oct., 1907
Empire Steel	5	.....	Feb. 28	2,281,400		.....	.....
Empire Steel pr	50	.....		2,500,000	6 cum	3 S. A.	July, 1906
Fay & Egan	100	.....	Feb. 20	1,000,000	6	1½ Q.	July, 1907
Fay & Egan pr	128½	.....		1,000,000	7 cum	1¾ Q.	Aug.,1907
General Electric	112	–4	May 15	65,167,400	8	2 Q.	Oct.,.1907
Harbison-Walker	14½	.....	Jan. 22	18,000,000		½	Oct , 1907
Harbison-Walker pr	69½	.....		9,600,000	6 cum	1½ Q.	Oct., 1907
International Pump	11⅛	– ⅝	June 5	17,787,300		1	Apr.,1905
International Pump pr	57⅛	.....		13,835,000	6 cum	1½ Q.	Aug.,1907
Lackawanna Steel	24	–1	March 14	34,971,400		.....	.....
Lake Sup. Corp	5	.....	Oct. 8	40,000,000		.....	.....
New York Air Brake	61	–9½	June 21	10,000,000	8	2 Q.	Oct., 1907
Niles-Bement-Pond	130	.....	Feb. 7	5,000,000	6	1½ Q.	Dec., 1907
Niles-Bement-Pond pr	105	.....		2,000,000	6 cum	1½ Q.	Aug.,1907
Otis Elevator Co	20	.....	March 19	6,375,500		1½ S. A.	Oct., 1907
Otis Elevator Co. pr,	68	.....		6,449,500	6 n. c.	1¼ Q.	Oct,, 1907
Penn. Steel	50	.....	May 14	10,750,000		.....	.....
Penn. Steel pr	90	.....		16,500,000	7 n. c.	3½ S. A.	Nov.,1907
Pittsburg Coal Co	10¼	.....	Feb. 10	28,297,600		.....	Nov., 1906
Pittsburg Coal pr	44⅛	.....		27,246,800	7 c.	3½	Apr., 1905
Pressed Stl. Car	18½	–2½	Feb. 21	12,500,000		3	Aug., 1904
Pressed Stl. Car pr	68	–1¼		12,500,000	7 n. c.	1¾ Q.	Nov., 1907
Pullman	145	–3	Nov. 14	100,000,000	8	2 Q.	Nov., 1907
Railway Stl. Spring	26	–4	March 1	13,500,000	4	2 S. A.	Oct., 1907
Railway Stl. Spring pr	76	.....		13,500,000	7 cum	1¾ Q.	Sept.,1907
Rep. Iron & Steel	15¾	–1¾	Oct. 17	27,191,000		.....	.....
Rep. Iron & Steel pr	64½	–5½		20,416 900	7 cum	1¾ Q.	Oct., 1907
Sloss-Sheffield	70	.....	March 6	10,000,000	5	1¼ Q.	July, 1907
Sloss-Sheffield pr	38	.....		6 700,000	7 n. c.	1¾ Q.	Oct., 1907
U. S. Pipe & Fdy	20¼	–2⅜	June 27	12,500,000	4	1 Q.	Sept.,1907
U. S. Pipe & Fdy. pr	58	.....		12,500,000	7 n. c.	1¾ Q.	Sept.,1907
U. S. Steel	25⅛	–1⅜	April 16	508,302 500	2 n. c.	½ Q.	Sept.,1907
U. S. Steel pr	86¾	–1¼		360,281,100	7 cum	1¾ Q.	Nov., 1907
U. S. Steel 5's	83⅜	–1¼		463,798 000	5	5 A.	.....
Va. Iron, Coal & Coke	40¼	.....	Sept. 18	8,641,600		.....	.....
Westinghouse Elec	42	–5½	June 27	24 998,700*	10	2½ Q.	Oct., 1907
Westinghouse Air Brake	153	.....	Oct. 2	11,000,000*		5 Q.	Oct., 1907

Par value of shares, $100, except those starred (*), $50.

The Franklin iron mines at Clinton, Oneida county, New York, are temporarily shut down, advantage being taken of this idleness to make necessary repairs about the mine and smelter.

NEWS FROM MANY INDUSTRIES

New Buyers:—

The Wisconsin Blower Co., Milwaukee, has been organized with a capitalization of $20,000 by William C. Kussmaul, William E. Cordts and Ida C. Kussmaul.

The Columbus Bridge & Iron Co., Columbus, O., has been incorporated with a capital of $50,000 by W. H. Renck, W. C. Painter, O. C. Hearing, S. D. Rogers and F. E. Slabaugh.

The American Steel & Iron Co., New York, has been chartered with a capital of $50,000. The directors are: Carl F. Price, Everett Gill and H. G. Connor, 170 Broadway, New York.

Arthur Jones, Arthur Gregg and E. A. Ashling have organized the Jones-Gregg Co., Sterling, Ill., with a capital of $20,000 to manufacture paper mill machinery.

Articles of incorporation have been filed by the Rochester Iron Ore Co., Rochester, N. Y., with a capital of $150,000. The directors are Frank M. Goff, D. Clinton See and Peter Commell, all of the address given above.

The Twice Two Cycle Engine Co., 142 Washington street, Chicago, has been incorporated to manufacture engines and machinery by Harry S. White, Elmer R. Casebeer and H. Ray Kingsley. The capital stock of the company is $10,000.

The S. S. Grady Co., Ltd., Boston, electrical machinery, has been organized with a capital of $3,000. The officers of the company are: President, Stephen S. Grady, Boston; treasurer and clerk, Herbert G. Perry, Rockland.

With an authorized capital of $5,000 the Chicago Metallic Sash Co., 404 Roanoke building, Chicago, has been organized to manufacture metallic work. The incorporators are: Conrad H. Sippel, Fred A. Rathje and Henry C. Calhoun.

The Cockrell Harvesting Co., New Orleans, La., has filed articles of incorporation with a capital of $50,000 to manufacture and deal in harvesting machinery. F. M. Cockrell, Henry McCall, W. P. Luck, B. A. Oxnard and others are interested in the new enterprise.

The Acme Tire Chain Co., New York, capital $25,000, has been organized by Alois B. Saliger and William Kerrigan, 514 Pearl street, New York, and Bernard Peritz, 457 Fifty-eighth street, Brooklyn. The company will manufacture skidding chains.

With a capital of $51,000 the Usona Stamping Works, New York, has been incorporated to manufacture metal stamps, dies, seal presses, etc. Those interested are James A. Watt, Alexander W. Watt and Leon Sussman, 199 Grand street, New York.

The Automatic Suction & Forced Draft Co., Washington, D. C., has been chartered to manufacture automatic suction and forced-draft systems. The capital stock of the company is $15,000, and the incorporators are: George S. Stewart, 755 Eighth street, and S. E. and Cornelius Lee, all of the address given above.

The Keeton Motor Co., New York, has been incorporated to manufacture motors, engines, etc. The capital stock of the company is $10,000, and the incorporators are: John H. Kellock, Frank P. Reilly, Walter E. Godfrey, 60 Wall street, all of New York.

The Rosenfeld Machine Co., New York, has been chartered with an authorized capital of $50,000 to manufacture motors, dynamos and other machinery, by Arthur J. Beedenbender, Flushing, N. Y.; Maurice Rosenfeld, Van Nest, N. Y.; Albert C. Someracki and Frank A. Someracki, Nutley, N. J., and William Zimmer, 628 East 135th street, New York.

New Construction:—

The National Enameling & Stamping Co., Milwaukee, has awarded the contract for the construction of a new building to its plant in that city. The structure will involve an expenditure of about $25,000.

The D. T. Williams Valve Co., Cincinnati, has acquired a site 50 x 269 feet on Hunt street, in that city, preliminary to the construction of a new plant. The structure, upon which work will begin about March 1, will be of concrete, five stories in height and 50 x 227 feet in size.

The Stevenson Iron Mining Co., Hibbing, Minn., which recently sustained a fire loss in its shops, is rebuilding along the lines of the original structures. A machine shop 50 x 80 feet, a blacksmith shop 40 x 44 feet, and a carpenter shop 32 x 40 feet, all iron clad, frame buildings, are being erected.

The Buettner & Shelburne Machine Co., Sullivan, Ind., manufacturer of cutter chains and cutter heads for coal mining machinery, is preparing to remove its equipment from Sullivan, where it has been established for the past five years, to a new plant now in the course of erection at Terre Haute, Ind. A. Shelburne is president and W. A. Buettner, secretary and treasurer.

The Milwaukee Gasoline Locomotive Mfg. Co., Milwaukee, recently incorporated with a capital of $50,000, will erect a manufactory at North Milwaukee 60 x 120 feet in dimensions.

The Davenport Locomotive Works, Davenport, Ia., has practically completed the erection of a new foundry, and expects to have it in operation by the first of the year. The new building is 105 x 200 feet, and will afford needed relief to the crowded conditions of the plant.

The Reeves Engineering Co., Mt. Vernon, O., recently incorporated, succeeds Reeves Bros., Columbus, O. The new company will continue to build the Reeves gas engine as well as a line of compressors and will manufacture gray iron castings. The plant of the Challingsworth Foundry & Machine Co., at Mt. Vernon, has been purchased and is now being rebuilt. A number of machine tools will be added to the previous equipment of Reeves Bros. to make the plant complete in both foundry and machine departments.

The Avery Mfg. Co., Peoria, Ill., advises that its recent incorporation was in fact its reincorporation, which was done in the way of an enlargement of the company. A large engine and thresher trade, and a particularly strong trade in its new double cylinder, undermounted type of engine, has been developed and this has opened a wide field both in the United States and foreign countries. The company's output will consist of a full line of corn growing machinery, farm wagons, engines, threshers, steam plow outfits, and in addition to these some new lines in the way of traction steam shovels, traction wagon trains, five yard ore and gravel dump wagons, etc. At the present time the company is building a new power plant of 1,000 horsepower, involving an expenditure between $40,000 and $50,000. A well equipped factory is now being operated. J. B. Bartholomew is president, and G. L. Avery, secretary.

General Industrial Notes:—

The Dayton Hydraulic Machinery Co., Dayton, O., has increased its capital stock to $350,000.

The capital stock of the Oesterlein Machine Co., Cincinnati, has been increased from $30,000 to $100,000.

The Firth-Sterling Steel Co., Pittsburg, has filed a certificate of increase in capital from $800,000 to $1,000,000.

At a meeting of the stockholders of the Chapman Valve Mfg. Co., Boston, it was voted to increase the capital stock of the company from $800,000 to $1,000,000.

The stockholders of the National Boiler Works, Superior, Wis., have elected the following officers to serve during the ensuing year: President, M. A. Ryan; vice president, J. D. Ryan; secretary and treasurer, H. M. McKenzie.

The Northfield Iron Co., Northfield, Minn., and 232 Endicott building, St. Paul, recently incorporated, manufactures improved expansion steel and cast iron road culverts, the Otis concrete mixer and gasoline engines. No equipment is needed at present.

The Blount Plow Works, Evansville, Ind., recently incorporated, is the successor to Henry E. Blount, and the business will be carried on in the same manner and by the same people as formerly. The incorporation is merely a step of convenience, and no changes whatever in the plans for the future are contemplated.

Reports of the fire which recently visited the plant of the Port Huron Engine & Thresher Co., Port Huron, Mich., are pronounced by the company to have been greatly exaggerated. The blaze was a small one, which was confined to a portion of the office, and the loss was not over $600. None of the company's works was in any way affected.

The Stanley Works, New Britain, Conn., manufacturer of hardware, has acquired the plant of the Girard Foundry & Machine Co., Girard, O., and will remodel the building to conform to its line of manufacture. The plant taken consists of a main building 35 x 110 feet and another 30 x 60 feet with annexes, a pattern shop 30 x 40 feet together with a blacksmith shop and office. The Girard plant will be operated as a branch of the New Britain works.

The W. H. Linton Co., Ogdensburg, N. Y., manufacturer of brass and steel specialties, has rebuilt the portion of its plant recently destroyed by fire, and now has about 10,000 or 12,000 square feet of space, which is a little larger than it formerly had. The company is also installing new automatic machinery, which will considerably increase its capacity and reduce the cost of production. Edgar A. Newell is president and treasurer, and James A. Wood, secretary.

The E. B. Van Wagner Mfg. Co., Syracuse, N. Y., recently incorporated, manufactures finished metal castings from alloys especially prepared by it. Charles Van Wagner, who is president and actively interested in the company, was for 25 years the senior partner of the Empire Metal Co., Syracuse, but sold his interests in the latter last May. The Empire Metal Co. manufactured babbitt metals and all grades of metal alloys and among other things produced the metal that the H. H. Franklin Mfg. Co. has used in its die castings, which has become commonly known as Franklin metal. Mr. Van Wagner is now giving his entire attention to producing new and improved alloys which the company is now offering to the trade.

With the completion of the new plant at Mansfield, O., the Seneca Chain Co., Kent, O., has taken another important step in its comparatively brief and remarkably successful career. The Seneca company was organized by a few Kent business men in 1900, with a capital of $5,000, and began operations in a very modest fashion. As the quality of the product became more widely known, the business of the company rapidly increased. Successive increases of capital from $5,000 to $50,000, and again in 1905 to $100,000 were necessitated. A further increase to $200,000 in 1906 was made and an additional plant at Zanesville purchased. Even these enlargements proved inadequate for the company's needs, and in April, 1907, a further increase in capital stock to $300,000 was decided upon by the stockholders and plans arranged for the erection of a modern plant at Mansfield. This project has been carried out and the company is now operating two well equipped plants and has a works force of 600 men and boys upon its pay roll.

The Defiance Pressed Steel Co., Defiance, O., recently incorporated, will conduct the manufacture of sheet steel bottle cases which was formerly a part of the business of the Clipper Plow Co. Owing to the rapid increase of its steel case business, the Clipper company found itself obliged to either enlarge its plant or discontinue operations in the implement line. Accordingly it has been determined to retire from the implement business entirely, and the incorporation of a new company has been the result. The Defiance Pressed Steel Co. takes over entirely the business of the Clipper Plow Co. Extensive improvements have just been completed to the plant, and the installation of a number of new presses will give the company double its former capacity. With the formation of the Defiance Pressed Steel Co. the city of Defiance becomes the center of the steel case industry of the country, having both of the two concerns in this line of business, the other being the American Steel Package Co., which is now operating a plant in that city.

Trade Notes:—

The Courtney Engineering Co., American Trust building, Cleveland, consulting engineer, announces that after Jan. 1, it will maintain an architectural engineering office exclusively, preparing designs for factories, mills and warehouses in steel, concrete and timber, fireproof offices, apartments and bridges. C. W. Courtney is president, and P. S. Schmidt, secretary.

Owing to the increase during the past year in the sale of its pneumatic tools and appliances on the Pacific coast, the Independent Pneumatic Tool Co., Chicago, has found it necessary to move its office and store room from 11 Front street, San Francisco, to larger quarters at 61 Fremont street, where it will carry a complete line of its Thor air tools and spare parts. The company's new location is in the heart of the machinery district.

Fires:—

The plant of the Tell City Machine Works, Tell City, Ind., sustained a loss of about $5,000 by fire Dec. 8.

The plant of the Meyer Machine Co., Petersburg, Ind., was partially destroyed by fire recently.

The foundry plant of C. H. Allmond & Co., Seattle, Wash., suffered a severe loss by fire Dec. 4, estimated at $10,000. The plant had been newly equipped.

The plant of the Pfau Mfg. Co., Cincinnati, manufacturer of specialties for plumbers' supplies, was heavily damaged by fire Dec. 11, entailing a loss estimated at upwards of $75,000.

Fire in the Kokomo Brass Works, Kokomo, Ind., Dec. 11, caused a loss of about $5,000.

The plant of the Billingham Iron Foundry Co., Trenton, N. J., was damaged by fire recently. The loss was not large.

The plant of the Marshalltown Drop Forge Co., Marshalltown, Ia., was damaged to the extent of about $4,000 by fire, Dec. 7.

TRADE PUBLICATIONS.

Motor-Driven Machinery.—The Cutler-Hammer Co., Milwaukee. Bulletin 22. 48 pages. 5 x 8 inches. This booklet is of special interest to everyone who sells motor-driven machinery to the navy department, as this company has made a study of navy department requirements and in this bulletin gives full descriptions, illustrations, dimension diagrams and shipping weights of starting panels, speed regulating panels, machine tool controllers, circuit breaker panels, etc. The way to select the proper piece of apparatus in each case is also explained.

Coal and Ash Handling Machinery.—The Jeffrey Mfg. Co., Columbus, O. Catalog D. 56 pages. 6 x 9 inches. This catalog calls attention to the various types of coal and ash handling machinery manufactured by it for power plants, including the Jeffrey steel chain over-lapping lip pivoted bucket conveyor, steel chain pivoted "close working" bucket conveyor, electrically-driven traveling hoist and grab bucket, V-bucket equipment, combined elevator and conveyor, etc. Installations of some of this machinery at power houses and other places is also given.

Tin Roofers' Handbook.—The National Association of Master Sheet Metal Manufacturers of the United States with offices at 2213 Chestnut street, Philadelphia, has issued a tin roofers' handbook, which is a text book for the instruction of roofers, sheet metal workers and their apprentices. It is being distributed free of charge by the association to anyone interested, and has for its object the instruction of roofers in the proper methods of laying tin roofs. The association has adopted standard working specifications which are given in the handbook fully illustrated. The book is of practical use to anyone interested in the choice of roofing material.

Elevating and Conveying Machinery.—The Geo. F. Wescott Co., Buffalo, is distributing a catalog entitled "The Labor Saver," published on the first day of each quarter, presenting price lists of the various devices which it manufactures, including elevator chains, buckets, sprockets, etc. The catalog contains useful information in the shape of tables of weight and tensile strength of substances, horsepower of engines, etc.

Prospecting Machinery.—The Cyclone Drill Co., Orrville, Ohio. Catalog. 96 pages. 6 x 9 inches. Illustrates and describes its various types of machinery for coal, water, oil, gas, mineral and placer mining, including cable, hollow rod, core and rotary drills for prospecting and well drilling, contractors' drills for blast holes, etc. The different accessories of the drills are also described with a number of illustrations. The latter part of the catalog contains testimonials and price lists.

Chucks.—The Skinner Chuck Co., New Britain, Conn., manufacturer of lathe, drill and planer chucks, faceplate jaws, drill press vises, reamer stands, etc., is issuing its 1907 price list of lathe, drill, scroll and planer chucks.

Electric Locomotives.—The General Electric Co., Schenectady, in Bulletin No. 4537 recently issued, describes a large number of present and proposed representative types of electric locomotives built by the company. Sketches are given of these locomotives, ranging from 17 to 150 tons for all classes of service, including mining, high speed passenger, slow speed freight, trunk lines, etc. Electrical and mechanical data are given also. The preface of this pamphlet briefly describes the reasons for the growing demand of electric traction and gives figures relative to the economy of substituting electric for steam traction in both passenger and freight work.

Vanadium Steel.—G. F. Ehrenzeller, Pennsylvania Bldg., Philadelphia, agent for Willans & Robinson, Ltd., Queen's Ferry, S. O., Flintshire, Eng., is sending out a very exhaustive and complete pamphlet on the subject of vanadium steel for motor car construction and for all classes of forgings. The pamphlet enumerates the special qualities of vanadium steel and gives illustrations of axles, crankshafts, connecting rods, piston rods, etc., made of annealed chrome-vanadium steel, type A. The catalog shows other types of chrome-vanadium steel, types D and E, used for automobile springs, gear blanks, gear-box shafts for motor bus construction and similar work and the last page of the pamphlet contains average static and dynamic tests of various steels manufactured by Willans & Robinson, Ltd.

Grinding Machinery.—The Clizbe Bros. Mfg. Co., Plymouth, Ind. Catalog. 56 pages. 6 x 9 inches. Presents illustrations, descriptions and price lists of its grinding machinery, including bench grinders, floor grinders, saw gummers, hand grinders, emery wheels, knife polishing machines, foot power grinders, etc.

Metal Roofing.—The Edwards Mfg. Co., Cincinnati, is issuing a catalog illustrative and descriptive of the Edwards metal shingles and metal slate, also hip and ridge trimming, valleys, crestings, etc.

Alundum.—The Norton Co., Worcester, Mass., in a catalog just issued recounts the development of grinding, its advance in mechanical lines from the grindstone to the electric furnace and calls attention to the invention of a new material for grinding wheels known as alundum, the process of manufacture, development and use of which is described in detail with a number of illustrations.

Iron and Steel Bars and Bands, Structural and Special Shapes.—The Interstate Iron & Steel Co., Chicago. Catalog. 56 pages. 4¼ x 7 inches. A neat little book listing and illustrating all the various sizes and shapes of material made at the East Chicago, Ind., and Cambridge, O., works of this company. The differentials for other than base sizes and the extras for cutting and handling the iron and steel are given in accordance with the National Iron and Standard Steel classifications. Several tables of weights of different shaped bars are given and attention is called to the twisted and plain bars for reinforcing concrete work turned out at these mills.

Elevating, Conveying and Power Transmitting Machinery.—The Chain Belt Co., Park street and Eleventh avenue, Milwaukee. General catalog No. 35. 287 pages. 6 x 9 inches. An unusually complete catalog, bound in buckram, the front cover containing a gold stamp of the name of the company and title of catalog printed on black ink. Illustrations of various styles of conveyors are presented, together with a number of installations at different places. The following portion of the catalog is devoted to illustrations, descriptions and price lists of water elevators for irrigation, drainage and pumping purposes. The subject of chain belt and sprocket wheels is next taken up. Items of importance given are tables of the approximate horsepower of detachable chain belts and price lists. Price lists of special or attachment links are also presented. The other styles of machinery manufactured by this company, such as interlocking renewable chain belts, with their attachments, special sprocket wheels for delivery end of conveyor with an additional price list, cast iron pulleys, chain tighteners, take-up boxes, malleable iron elevator buckets, etc., are illustrated and described in like manner.